

COMPUTERWORLD

SPECIAL 1994
FORECAST



► It's 1994. Welcome to the world of wireless, multiplatform, rightsized, group-enabled, GUI-based, object-oriented, user-empowered, decentralized, multimedia, massively parallel, totally open, mission-critical, almost-impossible-to-cost-justify computing. Our annual Forecast issue, which begins on page 13, will give you a head start on what promises to be another chaotic year.

HP to enter outsourcing

By Mark Halperin

Hewlett-Packard Co. plans later this month to formally launch an outsourcing division that provides system management and interim data processing to customers migrating to distributed computing. The move will stiffen HP's challenge to IBM, a well-known data center supplier.

HP joins the movement among outsourcing vendors to assist in

the transition to client-server computing. SHL, Systemhouse, Inc. and First Systems Corp. have taken a similar tack in taking on giants Electronic Data Systems Corp., IBM's Integrated Systems Solutions Corp. subsidiary and Computer Sciences Corp. HP is expected to focus on its own customers.

On Jan. 17, HP will announce that its new division is targeting Atlanta customer support center as a remote processing site. The division is also providing on-site pro-

The client/server outsourcing market is expected to reach \$6 billion by 1996, according to Forrester Research, Inc. in Cambridge, Mass.

cessing services, sources said.

The outsourcing program calls for HP to provide network and distributed systems management once a customer migrates to client-server systems, said one analyst, who requested anonymity.

HP plans to take a "selective outsourcing" approach that would resolve more around managing distributed computing installations than running corporate data centers, added Mike Melnosky, di-

HP, page 2

NetWare challenges

Users press for RISC

By Elisabeth Davis

Novell, Inc.'s promised port of NetWare to RISC platforms is running into deadline pressures from customers whose applications are hitting the wall on current Intel Corp. hardware and who are tired of adding more servers to their load.

But some users face up to a year's wait. Novell has promised NetWare on Digital Equipment Corp. and Sun Microsystems, Inc. RISC platforms by the end of 1994.

RISC, page 4

Serving the cause	
Running NetWare on Intel-based platforms is costly, particularly if multiple servers are required	
Microsoft's LAN Manager	\$46,368
Novell's NetWare	\$23,246
IBM's LAN Server	\$19,425
Banyan's Vines	\$17,299
AppleShare	\$12,740

Source: Business Research Group, Newton Mass.

Network operating system annual operating expenses: cost per server at single-server sites

IBM revamp further unifies product sectors

Melding systems in one unit may aid component sharing

By Michael Fitzgerald and Johannes Ambrosio

IBM's recent overhaul of its mainframe and PC groups means that, for the first time, all of the company's operating systems are under the same roof.

This will become increasingly important as IBM begins to share components among its product lines and could lead to an IBM that can easily offer customers sealable hardware and software, users and analysts said.

The shift came late in December when IBM Chairman Louis V. Gerstner split the Personal Systems group. He moved the Advanced Workstation division, home of the RS-6000 and AIX, and the Personal Software Products division, which makes OS/2, Workplace OS and Taligent, in with the ES/6000 and AS/400 groups (CW, Dec. 20).

The IBM PC Co. and Power Personal Systems were placed in a separate organization (see chart page 6).

Share and share alike

An internal memo from Gerstner, circulated on Dec. 17, said in part that the changes came because "there are enormous opportunities to share development and manufacturing capabilities across our product lines."

For example, company executives have said that object-oriented efforts spearheaded by Taligent will find their way into the AS/400 and other high-end operating systems, creating an

IBM, page 6

Per-user pricing gets boost

Informix's database fee plan could start industry trend

By Kim S. Nash

■ Informix Software, Inc.'s recent decision to shift to pure per-user pricing of its data products — and away from mainly hardware-dependent pricing schemes — could be indicative of an overall pricing and packaging revolution under way in the database industry.

For example, rivals Sybase, Inc., Oracle Corp. and The ASK Group, Inc. have acknowledged

plans to change pricing or packaging during the next quarter in response to user demands for simpler, more flexible schemes that can be tailored to client/server applications of varying size.

The flexibility aspect of client-server's appeal has highlighted two thorny problems with traditional database pricing:

• A large, expensive Unix database, such as Oracle 7, is overkill for a low-end workgroup application with a small number of users.

• Pricing factors "in size and model of hardware and number of named users frustrate companies deploying client/server systems, which contain more unknowns than host-

Pricing, page 8

Changing bases

Where the Big 4 Unix database players are making pricing or packaging changes:

Informix: Going to pure per user pricing, regardless of hardware platform.

Informix: Has already split database pricing into three classes that depend on the number of users, but it plans further refinements in early 1994, including the breakup of advanced features priced as discrete "products."

Continued on page 8



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Table of Contents

NEWS

- IBM PC Co. tells customers it will delay a new model of its high-end PS/2 desktops because of a problem with a new chip. *Page 6*
- Apple is expected to release server details at MacWorld, but don't expect the machines anytime soon. *Page 8*
- A blue-ribbon panel says old-fashioned productivity statistics don't measure IS' real payoff better customer service. *Page 10*



DESKTOP COMPUTING

- Those 32-bit operating systems may hold promise, but they have yet to deliver benefits to users. *Page 63*
- PowerPC takes on Intel in heavyweight battle. *Page 65*

WORKGROUP COMPUTING

- Now that off-the-shelf client/server applications have proved themselves in the human resources market, watch for similar progress in financial applications. *Page 21*



ENTERPRISE NETWORKING

- New LAN services and expansion of the broadband and wireless networking infra-

structures are on tap for 1994. *Page 70*

LARGE SYSTEMS

- Digital has to get its sales staff in shape for 1994, while CA continues to enjoy boom times. *Page 92*

APPLICATION DEVELOPMENT

- You can expect object-oriented development standards to fall into place during the coming year. *Page 91*

COMPUTER CAREERS

- If you've mastered the Windows API, switching to NT is a snap. *Page 97*
- Beef up those project management skills in a recent survey, only 30% of the respondents said they think their project managers are well prepared. *Page 95*



MARKETPLACE

- Read between the lines of vendors' summary benchmark reports. *Page 109*

Forecast section.....	Page 13
Company Index.....	Page 117
Letters to the editor.....	Page 62

Editor's note

From '93 chaos, future success

There's a terrific, almost trademark scene in the movie *Home Alone* when the young deservetee is trying to get comfortable with the trappings of his newfound independence. After laughtering for a close shave, he pours a heaping helping of dad's cologne into his cupped hands, splashes the alcohol-laden mixture onto his face and...AAAARRRRGGHHHHH! THAT HURTS LIKE HELL!



The IS community today is home alone.

Somewhere in the last few years, information systems were left alone as well. The most and tidy community of vendors, buoyed by various de facto standards promulgated chiefly by IBM, shepherded IS through the growth stages of hardware, software and networking. The systems were programmed by IS for systems that they were designed and built. It was an orderly time, a nurturing time. An occasional slip of dad's beard a drop of watered-down aftershave on the cheeks.

Of course, it wasn't all that simple. But today, I'd wager it sure seems that way, relatively speaking.

The IS community today is home alone. Here, fixing yourself some client/server stew for breakfast. Yuck! That tastes terrible. Full of

bones, too.

Maybe I'll flip on the stereo and listen to some soothing interperability tunes. Holy #&@%! Myears!

Perhaps I'll just lie down and catch a nap on mom and dad's queen-size bed of open systems. You? There are bugs in this bed, lots of 'em, bogones!

Then there's this constant parade of salesmen at the door, each of them selling a bit of the solution to your woes here, a bit there. Problem is, the bits just don't seem to work together when you try to make one bit work with another. And these salesmen are hurling all sorts of oxymoronic-sounding buzz-phrases at you, such as "multiple standards."

Yup, it's plenty chaotic out there. Too many choices, not enough direction, but cheer up. The greatest achievements in history have been born of adversity and chaos, both of which are in great supply.

So you have to believe your greatest successes are yet to be.

Bill Labers
Bill Labers, Editor in Chief

HP to enter outsourcing

(CONTINUED FROM PAGE 1)

rector of service business strategies at International Data Corp in Framingham, Mass.

HP has already signed a number of Fortune 100 clients, including Ford Motor Co., according to the analyst who requested anonymity. Ford could not be reached for comment by press time.

HP declined to comment on its outsourcing endeavors other than to say it has created an outsourcing division headed by Layne Southerberg, previously a marketing manager in HP's customer support organization. The new division is part of that organization, which also provides maintenance, help desk support and systems integration services.

Smart move

Users said they view the move as a smart business play to collect services revenue in a world where margins on hardware are growing slimmer.

Bowser, John Jaworski, chief information officer at Barber-Colman Co. in Rockford, Ill., pointed out that success in the outsourcing business is no small feat.

"I'd be concerned about them branching out too much," Jaworski said. "I don't know that they have the support structure because they're having trouble supporting customers with large data centers."

He declined to elaborate on HP's specific data center support shortcomings other than to say the company has a shortage of people skilled in supporting mission-critical environments.

Another HP user, who asked not to be identified, agreed, noting that HP "does not have the experience at running large data centers."

Tim McCollum, an analyst at Dean Witter Reynolds in New York, said he expects

HP to focus its outsourcing activity on existing customers because the company would have difficulty presenting itself as an objective services provider unattached to selling HP-brand hardware and software. "You're seeing a lot of hardware companies making that move just to leverage their own hardware," McCollum said.

The analyst who requested anonymity said that while HP will initially process for customers who use HP platforms, it is hiring other outsourcing specialists to handle processing of non-HP hardware.

HP, historically, has waited to enter segments of the computer services market. It was lately getting into systems consulting because it feared competing with partners such as EDS and Andersen Consulting.

Senior editor Craig Stedman contributed to this story.

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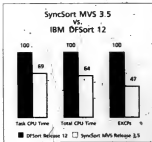
OUTSOURCING

Outsourcing support

HP has been one of the few major computer makers that does not offer outsourcing services. No. 1 IBM has an outsourcing subsidiary, and No. 3 Digital Equipment Corp. has a dedicated outsourcing unit. Unisys, too, has an outsourcing unit.



**IF IT WERE GREASED, IT
WOULD BE ALMOST AS FAST
AS SYNCSORT.**



Users press for RISC

CONTINUED FROM PAGE 1

as part of its Processor Independent NetWare initiative.

Some relief may be on the way for Hewlett-Packard Co. users, however, because HP has targeted the first quarter, or the second quarter at the latest, for its PA-RISC implementation of NetWare.

And Oracle Corp., in response to strong customer demand, plans to provide its SQL database server on HP's NetWare platform as soon as that platform ships, said John Pilot, vice president of Oracle's a HP products division.

Meanwhile, rather than wait, information systems managers may decide to move their SQL database services from NetWare Loadable Modules (NLM) to an existing non-NetWare RISC-Unix platform.

Other users said they would look at Process Independent NetWare when it appears.

Lourdes Hospital, for example, needs a RISC-based platform to handle its long-term corporate database needs. Lourdes is buying Gupta Corp.'s SQLBase Server and debating Unix vs. an NLM as the underlying platform, said Tom Witteman, PC support specialist at the Binghamton, N.Y., hospital.

Being able to upgrade NetWare file servers to RISC and run the database engine off the same stations "would be wonderful," he added. A more powerful NetWare platform cannot come too soon for companies such as Morgan, Lewis & Bockius, where server overloads are a common occurrence, said Donald Sternfeld, director of IS at the Philadelphia law firm.

With "all of our users wanting to access all applications," the firm must constantly upgrade its hardware and storage capacity, Sternfeld said. "Unfortunately network operating system vendors regard hardware as a commodity."

Unknown quantity

Meanwhile, Novell is positioning its Unix/NetWare blend, UnixWare, to catch users who insist on Unix-based application servers, which

can work in tandem with NetWare file and print services. However, some users said they still view UnixWare and Novell's plans for it as a question mark.

One major financial company plans to evaluate UnixWare, along with other Unix platforms, as its enterprise database application server, a systems consultant at the firm said. In addition to providing a more robust environment than NetWare, most Unix systems support symmetrical multiprocessing (SMP), which allows heavy-duty applications to harness the power of more than one CPU, he pointed out.

UnixWare is scheduled to support SMP sometime in 1994. Novell plans to clarify its multiprocessing plans for NetWare early this year, said Bob Young, vice president of the NetWare products division.

What to do now

Customers with immediate database bottlenecks can take the step of distributing the SQL database services across multiple 386-based NetWare servers, Young said. Novell 4.01's NetWare Directory Services (NDS) can transparently route clients to whichever server has the requested data. Such a hardware configuration tends to cost less than a single RISC box, Young said. It costs about \$10,000 total for four 386 single-processor boxes vs. \$20,000 for a typical four-processor box.

However this type of solution works only for companies that don't have data-distribution for databases applications or user groups, Pilot said. While NDS works fine for routing and for user queries to the right database server, partitioning production databases across multiple servers "is far from optimal," he added.

Production databases, which require major CPU crunching, are primarily the applications that are "running out of breath" on current NetWare/NT platforms, Pilot said.

Users also see the move to RISC as a means of consolidating their applications onto fewer boxes, a move that saves money not so much in hardware costs as in administrative expenses, vendors, analysts and users agreed. Nor is NetWare by any means the least-expensive network operating system to administer, according to a recent Business Research Group study

Cisco offers direct link to host processors

By Joanne M. Wesler

■ Moving to further tie down the hierarchical IBM network walls, Cisco Systems, Inc. will announce today a direct channel connection for its high-end routers, according to sources familiar with Cisco's plans.

The goal of the product, which is en route to beta testing and is slated to ship midyear, is to link corporate mainframes directly to TCP/IP. Novell Inc. NetWare and Open Systems Interconnect LANs.

Bundling the host-to-LAN connectivity within a router — in this case, the high-end Cisco 7000 — would obviate in many cases the need for IBM's 3172 controller, an OS/2-based "liaison" device with a host connection on one side and a LAN connection on the other. A 3172 costs from \$15,000 to \$50,000.

Direct connections from the router to both IBM's fiber-based Escon and copper-based bus-and-tag channels would also eliminate the need for many functions of the IBM 3174 front-end processor, analysts said, which could roll into IBM's sales of the up-to-\$2 million devices.

Observers said the Cisco product could simplify management, reduce the number of potential network points of failure and possibly increase network throughput. They also said the link's success will depend on how well it emulates the 3172.

For example, provided Cisco offers an applet-to-apples approach, "we'll consider it for simplified management and better performance," said Kurt Muehlbauer, supervising analyst at Comshare Edition in Chicago, a large Cisco shop planning to install the 7000 in 1994.

Caution: Overload ahead

Anura George, an independent consultant in New York, N.Y., cautioned users to think carefully before trusting their host-to-LAN link to "company that until three months ago did not know what a bus-and-tag cable was." He estimated that at least 50,000 IBM 3172s and 5,000 to 10,000 3174s — the devices the Cisco product aims to emulate — are located today.

Off-load vehicle

On the other hand, the utility is running a 3172 model with IBM's "off-load" feature, which shifts some of the protocol processing from the mainframe to the controller. Muehlbauer said he wondered if Cisco would compete on this feature.

Cisco would not comment on its product plans at press time.

However, Frank Dzibek, president of Communications Network Architects, Inc., a Washington consultancy, said, "It is a good implementation. I've seen the documentation."

Ferengi's Windows shortcomings raise red flag

By Stuart J. Johnston and Ed Scannell

PC users considering OS/2 for Windows will encounter incompatibilities if they upgrade from Microsoft Corp.'s Windows for Workgroups 3.11.

The IBM product, code-named Ferengi, was designed to let Windows 3.1 users easily upgrade to the 32-bit OS/2 without changing any of their system and software configurations.

But internal documents based on Microsoft testing show that OS/2 for Windows will not work on PCs that have either Windows for Workgroups 32-bit file system or MS-DOS 6.2's DoubleSpace disk compression installed.

For example, OS/2 for Windows will not successfully install on a PC with DoubleSpace because it cannot see the compressed drive, according to the Microsoft memo that describes the company's test results. "Additionally, when installed on top of [Windows for Workgroups], nei-

ther the operating system nor any Windows applications would run," the memo continued.

"I think people want to double their hard disk, and they like the 32-bit file access and speed," said Jonathan Roberts, Windows group product manager at Microsoft.

Out in the cold

Such incompatibilities could effectively freeze OS/2 for Windows out of those markets because they eliminate one of IBM's biggest selling points — the product's ability to install right over the top of existing Windows-based systems.

More chilling is the fact that Microsoft recently announced that some 30 PC

OEMs, many of which are second-tier companies, will ship both server and desktop machines with only Windows for Workgroups 3.11 and MS-DOS 6.2 on them.

But at least one analyst was skeptical about whether the problems would prove to be a barrier for corporate users. "Any corporation that has any intention of using Ferengi is going to have the brains to specify Windows 3.1" instead of Windows for Workgroups, said Matt Cain, program director of workgroup computing strategies at Meta Group, Inc. in Westport, Conn.

"There are 40 million [Windows 3.x] users, and this product is a legitimate option for them. If IBM picks up just 10%, that's 4 million



No slouch

OS/2 for Windows appears to be off to a fairly fast start. Company officials said about 100,000 copies shipped in the first four weeks of the product's availability.

users they would not have had," said Will Zachmann, president of Canopus Research, Inc. in Duxbury, Mass.

Wait and see

IBM officials acknowledge that OS/2 for Windows currently does not work well with Windows for Workgroups. "Until we see more demand for Windows for Workgroups [3.11] in the market, we see no need to rush to support that function," an IBM spokesman said.

At last month's unveiling of OS/2 for Windows, IBM said it would support Microsoft Corp.'s Win32s application programming interface.

This support would let OS/2 for Windows take some advantage of the virtual device drivers in Windows for Workgroups 3.11. IBM officials, however, have yet to admit whether the company would support all of those virtual device drivers or when that support would be available.

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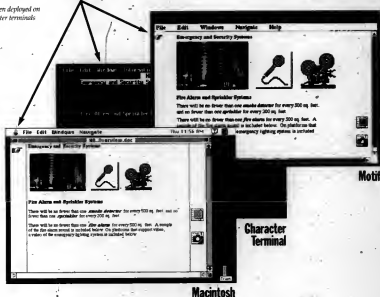
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Manager IS Dev.
British Telecom, UK



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News Shorts

Digital plans DECnet Phase IV phaseout
Digital Equipment Corp. will likely phase out its DECnet Phase IV networking transport after arrival of the next version of the OpenVMS operating system, which is due out in the spring. That would force DECnet Phase IV users to migrate to the newer DECnet/OSI transport or switch to TCP/IP. Larry Walker, vice president of network engineering at Digital, said a continuation of Phase IV support has not been ruled out, but he added that the company is now spending most of its transport resources on TCP/IP-related products.

Workplace forms due from IBM

IBM is about to enter the burgeoning electronic forms market. It will ship in the next 90 days a FormTalk offering that will be one of the first applications to take advantage of the Workplace Shell on OS/2. This will make it easier for end users to create their own forms, IBM claimed, simply by clicking on various objects. A Windows version is due in mid-1994.

Court rules on EDS' use of CA software

A UK court has ruled that a non-IBM subsidiary of Electrodata Data Systems Corp. must limit its access to Computer Associates International, Inc.'s software. The ruling follows a disclosure to the court of CA's action against EDS over improper use of its software in the U.S. Under the decision, DAVT Ltd., soon to become an EDS subsidiary, will discontinue its use of CA software over the next four months.

Blue on Blue

IBM's Integrated Systems Solutions Corp. (ISSC) outsourcing subsidiary has inked a 10-year, \$400 million "technology alliance" deal with Blue Cross/Blue Shield of New Jersey. The pact calls for ISSC to provide data processing and help migrate Blue Cross to client/server architectures. Blue Cross Chief Executive Officer William Marino said the contract represents "substantial" cost reductions, but he added that the health insurer's prime motivation was to gain greater access to emerging technologies to help it move into managed health care and compete against larger insurance companies. ISSC is absorbing 312 information technology staffers at Blue Cross and offering similar or better salaries and benefits, Marino said.

Proton touts DSLw use, projects loss

Systems integrator SHL Systemhouse, Inc. in Ottawa has likely become the first company to use a non-IBM implementation of Data Link Switching (DLSw), which is now supported on its Proteon, Inc.-supplied routers. DLSw brings together in a standard way various SNA-in-IP encapsulation features. Proton, meanwhile, said it intends to report a substantial loss for the fourth quarter ended Dec. 31 and is seeking restructuring guidance from New York investment banker Lazarus Frères.

SHORT TAKES Lovi Strauss & Co. said it is transferring computer operations to Dallas to avoid possible earthquake damage. A data center insider, however, said the firm is making the move to reduce costs. Oracle Corp. said that for the second quarter ended Nov. 30, revenue increased 55% to \$432 million while net income grew by 80% to \$62 million. ... Sitara Computer, Inc. will take a \$26.2 million write-off for research and development costs associated with its recent acquisitions of Shared Financial Systems, Inc., BellSouth Systems Integration, Inc. and Distributed Systems, Inc. The overtime charge will be taken in the fourth fiscal quarter, which ended Jan. 2.

PS/2 delays cause minor stir

By Michael Fitzgerald

■ The IBM PC Co.'s recently disclosed delay in shipping high-end models of the PS/2 is an inconvenience, but not a crisis, customers and partners said.

A PC Co. spokesman attributed the delay to a faulty controller chip meant to improve system performance of follow-on versions of the PS/2 Models 76 and 77. The chip integrates memory, the memory controller, level two cache, the Micro Channel bus controller and a local

bus controller. The systems, which were expected to ship in January, are now slated to arrive in March, the spokesman said.

"Yes, it's a concern, but you don't want a product recall, and there's nothing magic that the machine had that they had to come out the second week of January," said Bruce L. Linker, president of the Microcomputer Managers Association and vice president of information systems of a large financial services company.

Wilhelm Tauscher, chairman of Computerland Corp. in Pleasanton,

Calif., said he did not expect to see a backlash against IBM from major corporate accounts. "IBM has gotten very aggressive in making arrangements to substitute for PS/2s, either by beefing up lower-end systems or bringing higher-end systems down to replace orders," Tauscher said.

Still, analysis said the product glitch, coming after lengthy PS/2 backlogs, an inordinately slow design cycle and problems with the ThinkPad 560 subnotebook, has not helped the PC Co.'s image in the market.

IBM revamp further unifies product sectors

CONTINUED FROM PAGE 1

environment for better application portability across platforms.

"This move is about working off your bases and having scalable architectures," said Robert Djurdjevic, president of Amers Research in Phoenix. Djurdjevic said that while it was still too early to tell, "this is perhaps the beginning of a new, consolidated IBM world."

But some said IBM has made similar moves before, but with little success. "Sure, it makes sense that IBM is trying to ensure interoperability among the systems, but that's not new. They've been saying that for years," said an information systems executive at a large IBM shop who requested anonymity.

For the most part, however, as-

ters welcomed the opportunity to see more technologically unified IBM.

"I don't have a clear path to move from my LAN server to using the mainframe as a server using

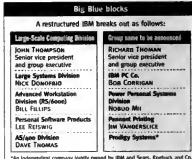
tin, Texas.

Nagney said IBM's tools for running LAN software on a mainframe are "cost-prohibitive" right now, and this prevents him from using the mainframe as an enterprise-

wide server. But, he added, the reorganization puts IBM in a position "to help us make that move" because it looks as though IBM may eventually provide a migration path from the LAN to the mainframe.

Other users questioned how long it would take for the reorganization to actually produce something tangible.

"I think they're heading in the right direction," said Richard Layman, data processing director at Indiana Harbor Belt Railroad in Hammond, Ind. "But it won't buy me anything right away. I'll believe it when I see it."



the [LAN] software, which is what I'd like to do," said Charles H. Nagney, senior director for development and operations at the American Cancer Society in Aus-

PC appointment gets mixed reviews

Louis V. Gerstner's naming of longtime associate G. Richard Thomson to head of IBM's PC units drew a neutral reaction from observers and numerous comparisons to former Apple Computer, Inc. chairman Jobs Sculley.

Thomson, like Sculley, is a career marketer who comes to the PC industry from a consumer products giant. In this case R/R Nabisco, Inc. He will take over many of the PC units handled by James Cannavino, who was promoted to corporate vice presi-

dent of strategy [CIV, New JS].

Gerstner has charged Thomson with preparing the IBM PC business to compete in a predicted consumer boom. Observers and insiders said not to expect the emphasis on consumer markets to distract the units from their core corporate business.

William Tauscher, chairman of Computerland Corp., called Thomson's appointment a rational move. "If you look at the guys making the key decisions, they're traditional IBM born-and-bred tee-suit types, but

not one of them has ever worried about a world with consumers and the retail world."

Thomson will also run IBM's interest in Prology Services, Inc., which is a joint venture with Sears, Roebuck and Co. and Penland Printing, the IBM printing systems company Penland, which makes high-end printers oriented toward large systems, was put in Thomson's group to even out responsibilities among unit managers, according to an IBM spokesman.

—Michael Fitzgerald



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Apple ready to talk PowerPC server

By James Daly

Apple Computer, Inc. is expected to detail plans for firing up its server line with the speedy new RISC-based PowerPC chip during briefings for its new PowerShare Collaboration Server software at this week's Macworld Exposition in San Francisco.

Power-starved corporate Macintosh users have already installed Apple's first trio of true dedicated servers—Motorola 68040-based servers that started shipping in May. These servers will be upgradeable to the PowerPC RISC chip. However, some users are still holding out for the added punch of the PowerPC chip.

"I'm not getting rid of my Sun [server]

just yet," said James Vip, who supervises more than 3,000 Macintoshes as a manager of technical services at Ernst & Young in Toronto.

Don't look too soon

But don't look for PowerPC-based Macintosh servers too soon. Insiders said Apple will not offer its PowerPC desktop systems until March, and the servers are not expected before the end of the year.

Apple is expected to start with its flag ship server, a PowerPC version of the Workgroup Server 95 sporting the 620 microprocessor. The powerful chip is intended for products offering premium performance and a full 64-bit architecture.

It will also be used in some workstations.

The currently available Workgroup Server Models 80, 86 and 96 are essentially enhanced versions of the Macintosh high-end Quadra, but contain elements to enhance their specialized roles as servers. As special processors—direct slot, for instance, helps provide fast hard disk I/O, and a second-level memory cache cuts the time the microprocessor spends getting information from RAM. Sources familiar with Apple's plans said its PowerPC servers are likely to include several processors. The flagship will be a PowerPC-based version of the Workgroup Server 95 running under the PowerOpen operating system.



Available in June, PowerOpen is a next-generation Unix operating system and one of the bedrock technologies slated to come out of the Apple/IBM technology alliance. Users said they are hoping that the Macintosh's traditional ease of use, coupled with the heavy PowerPC chip, will make it easy to embrace Unix. Some users said they hope Apple will fix the bugs in the Workgroup Servers in the way to a PowerPC version. Suggestions for improvement range from plans for better audit trails to simpler issues such as complaints about the key slot.

"When you twist it one way, it locks the machine, but if you twist it the other, it turns it off," said Michael Keithley, who manages a Model 85 as an information systems director at Creative Artists Agency, Inc. in Beverly Hills, Calif. "So I have people accidentally turning off the server. That's inexcusable."

Per-user pricing

CONTINUED FROM PAGE 1

based environments.

"Small, medium and large is how [database makers] should do it," said John Morrell, an analyst at International Data Corp. Sixties per-user pricing would "give us more room to make sure we're buying the right size database for each project. I welcome that," said Carl Exposito, regional chairman of the New York Area Oracle Users Group.

One price for one size database, regardless

of size NT. But the vast price difference "opened a lot of eyes," said Bill Shattuck, an analyst at Montgomery Securities in San Francisco.

For example, a 50-user Unix-based Oracle 7 database can cost about \$42,000, according to Oracle; an unlimited-user version of Microsoft's SQL Server for Windows NT, meanwhile, is priced at \$15,000, Microsoft said.

Unix database makers historically have not published prices, preferring instead to arm salesmen with general price guidelines for negotiating with individual users.

But client/server-savvy users dislike having to study a complex price matrix that weighs hardware platform size and model against precise numbers of users for a given application, said David McGovern, president of consulting firm Alternative Technologies. This can impede the process of rolling out client/server applications, McGovern said.

Informix's answer is to move to pure per-user pricing for its SE and Online databases, regardless of the hardware on which the systems run. Fees for the high-end Online database are \$1,200 per user for a developer's license and \$800 per user for runtime licenses, with a five-user minimum.

While Oracle's pricing is comparable per seat (see chart), it "has been a

disadvantage" without a small, lesser-function database, Morrell said. Informix can afford to go per-user because it will sell its less complex SE database to users looking for smaller configurations, he added. Informix will save the enterprise-level Online database, which is more expensive to develop, for customers with several hundred users or more, he said.

Oracle has no plans to offer straight user-based pricing, said Brett Bachman, vice president of systems product marketing at Oracle. However, the company, which has historically catered to business applications, plans to plug product-line holes with a series of low-end databases. OracleWare is

a family of smaller, easier-to-install databases aimed at departmental users. It comes bundled with NetWare and UniWare from Novell, Inc. Also expected by mid-1994 is a 10-user, under-\$3,000 "lite" product—Oracle's LAN Server—to the shrink-wrapped and sold through indirect channels [CW, Dec. 13].

Price considerations

The moves illustrate how important price has become for database users, Shattuck said. Microsoft "made it an issue and Oracle needs to come back at them."

As do other database makers.

ISO plans to "fine-tune" Ingres database sales at month's end, said Beverly Brown, senior product marketing manager. The company condensed pricing to three levels based largely on CPU size in June. However, more changes loom. Brown said, to accommodate features being added to the Ingres database.

For example, Ingres/Replicator, an add-on module for managing distributed systems, will be priced separately rather than as part of the Ingres database license. Replicator would cost every user the same amount of money, no matter how much was spent on the core Ingres database license.

Sybase plans to rethink pricing, despite its tag-team pact with Microsoft (see story below). It plans to go per-user on low-end Novell NetWare database pricing in early 1994.

Tag team

The Sybase and Microsoft plan to capitalize on their joint development pact for SQL Server products by operating as tag-team database marketers, might not be as cut-and-dried as they think.

Under their arrangement, Microsoft will go after departmental users who do not require much consulting help and who prefer to buy through resellers, while Sybase will position itself as a database supplier to users deploying high-end, mission-critical client/server applications.

If, without NT lives up to its billing as an enterprise operating sys-

tem, Sybase may find Microsoft increasingly encroaching on its turf at the enterprise level.

What could also complicate matters "there is the potential for overlap in Sybase and Microsoft's efforts. Ideally, the customer should be able to pick which [SQL Server version] he wants and Sybase and Microsoft should be relatively neutral," Epstein said. "We're not at that ideal state yet." —Kim S. Nash

Changing bases

Continued from page 1

Oracle: Pricing will remain traditional. For example, database strategy is changing as a function of both the number of users and the CPU size. New features are priced as a percentage of database fees. But Oracle's low-end strategy is changing with "lite" databases, some of which will be bundled with Novell NetWare or UniWare and sold through indirect channels.

Sybase: Largely traditional but plans to go per-user on low-end Novell NetWare database pricing in early 1994.

Database derby

A sampling of database schemes and prices for common product configurations:

DATABASE	PRICE
MICROSOFT SQL Server uses Windows NT	
10M 02/27 FOR 05/2	\$1,995 for a 10-user system, \$995 for a single-user system
	\$45/user
IBM DB/2	
IBM DB/2 02/27 FOR 05/2	\$2,000 for a two-user system to \$10,000 for 16 or more users \$10,000 for a two-user system to \$100,000 for 256 or more users
ORACLE 6	
ORACLE 6 02/27 FOR 05/2	\$1,200/concurrent user or \$10,000/user
ORACLE 6 02/27 FOR 05/2	\$1,200/concurrent user or \$10,000/user

of the hardware for which the system is destined, would "make life a lot simpler," said a project analyst at a major insurance advisory firm in Florida. The company has delayed its go-live schedule for several client/server systems for "at least a quarter, maybe two," because of the complexities and expense involved in buying Oracle, the analyst said.

Pricing pressures

Users are not the only source of pressure for Unix database firms. Microsoft Corp. is putting the squeeze on via aggressive pricing for its workgroup-level SQL Server for the Windows NT database. In some configurations, the product costs 10 times less than comparably sized systems from Oracle.

To be sure, an Oracle database on the Unix system sports more functionality than the smaller SQL Server running on immature Win-

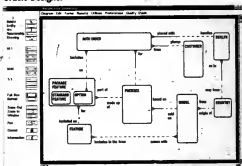
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ORACLE

Real IS payoff lies in business benefits

By Mitch Betts
WASHINGTON

The U.S. service sector's huge investment in information technology during the 1980s produced virtually no gain in productivity according to government statistics. However, that data misses the real information technology payoff,

which came in the form of business benefits such as higher market share and better customer service, according to a major new report by the prestigious National Research Council.

Outside experts agreed with the report, which focuses on the so-called "productivity paradox."

The traditional productivity measure

(output per labor-hour) is fine for wheat and steel, but "the way we study productivity is not adequate for the Information Age," said Gordon B. Davis, MIS professor at the University of Minnesota.

Simply put, unless the information systems investment triggers worker layoffs, it does not show up in macroeconomic productivity figures, Davis said.

Missing from those calculations, he said, is the role IS plays in improving customer service, inventory management, financial analysis and other business functions, as well as creating new services.

The debate is rooted in the fact that U.S. service industries spent more than \$750 billion on IS hardware alone in the 1980s, yet the sector managed a tiny 0.7% average yearly growth in productivity during that time.

Waste, bungling and bad stats

The panel said possible explanations for this paradox include wasteful or mismanaged IS investments, faulty statistical measurement and the possibility that IS-generated productivity gains are offset by other factors or take more time to show up.

After interviewing business and IS executives and citing well-known IS success stories such as Wal-Mart Stores, Inc. and American Airlines, the research committee concluded that information technology has produced positive benefits for the service sector.

That anecdotal evidence is not likely to end the productivity debate, however, since there are also stories of botched IS investments, productivity losses from technical glitches and employees using office PCs for playing games. But the report does show that it is misleading to rely solely on productivity as a measure of IS impact.

Tough to measure

A classic example of beneficial information technology that does not appear in national productivity figures is the deployment of automated teller machine networks in the 1970s. A study by Brian L. Dos Santos, now at the University of Louisville in Kentucky, showed that "early adopters" such as Citicorp won more market share and profits as a direct result but showed no productivity gain because the company did not reduce costs or labor.

Davis and Dos Santos said the recent wave of layoffs spawned by information technology-enabled business re-engineering projects may boost productivity figures in the next few years.

Many IS executives consider the economists' debate about the IS/productivity link irrelevant, Davis said, because IS executives care more about competitive advantage, financial results and customer service.

Proof that technology pays off remains elusive. See story page 56.

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16 The Disorganization Chart

You might as well draw those boxes in pencil



JENS
PECKERTON
says the
days of
ethereal
CIOs are
behind us
PAGE 16

16 Business changes are testing the metal of IS structures, forcing them into bold, new shapes.

20 Distributed systems and extended organizations require new communications technologies... and new kinds of IS pros.

24 Don't expect any lull. Companies will continue to look for technology-supported process improvements. They have to.

28 End users now know what they want. And if IS can't deliver, they'll find someone who can.

30 Crunch! An Industry Restructures

The new industry order is anything but orderly

30 Some people call Microsoft and Intel the IBM of the '90s, a characterization that makes them very uncomfortable.

31 Not having a product doesn't stop vendors from selling one these days. Users are taking it in stride.

33 It's a make-or-buy year for some of the industry's biggest players, and the prospects of failure aren't pretty.

35 Our fabulous trivia quiz will stretch your mind — and your disbelief.



GATES
(above)
GROVE:
The
Amnco
big hold
more over
phatic
market
PAGE 30

42 Recreating the Mainframe

The corporate host computer isn't going away — it's just spreading out



TURNER
CONSTRUCTS
TOM'S JAIL
Gard is at
wingspan up in
demonstrating
PAGE 42

42 This should be the year that client/server tools finally grow up, but IS is stepping cautiously, anyway.

45 Going object-oriented? You may not be alone, but you are travelling in a very small circle.

48 SNA is reluctantly becoming a member of the internetworked corporation, thanks to a flurry of product activity.

49 Are mainframes going away? Whom, PC breath. Our survey finds big users and big iron will be soul mates for a while more.

52 Easy Promises/Hard Realities

You always knew it couldn't be that simple, and it isn't

52 Sure, the right systems can give you an edge in the market. Just don't expect it to last.

56 How can you prove you're doing it more profitably? That's the productivity conundrum.

57 Someday interoperability will happen without heavy lifting and nerve strain.

58 We're getting more efficient at developing applications, so how come there's still a backlog?



The Disorganization Chart

NO, THINGS ARE NOT GOING TO GO BACK TO "normal." This *is* the norm now — constant adjustment, rising expectations, no rules that last longer than 30 minutes and teams that form, dissolve and reform again around something else.

Welcome to 1994. Welcome to competitive collaboration, CIOs without portfolio and end users who haven't got a grain of respect for what you know about any system. Sure, it's hell being an IS executive in this new world of infinite choice, boundless expectations and distributed everything and everyone. But consider the alternative.

IN THIS SECTION



In the land of distributed systems and dispersed business operations, connective technologies will rule. E-mail and EDI are just the beginning.

page 28

NO MORE

It has been a while since you've heard someone talk about "Business as usual." Haven't it? You may never hear it again.

page 34

Outtake



On why those little boxes matter: "Good people in a poor organization... structure will fail, while average people in a good organization are likely to succeed."

By DAVID MEYER, IS MANAGEMENT CONSULTANT

STRUCTURAL CHANGE

Dotted lines and crooked arrows

IS departments don't look (or act) like they used to

BY MITCH BETTS

RATHER THAN AN ORDERLY PYRAMID OF boxes and solid lines, the organizational chart for the information systems function in corporate America is starting to look more like a Rubik's Goldberg illustration — full of dotted lines and crooked arrows leading into business units.

Corning, Inc., for example, has stationed corporate IS liaison staffers in each business unit. Texaco, Inc. has created a steering committee of business unit IS managers. Wal-Mart Stores, Inc. has reorganized into teams that focus on particular corporate goals.

This blending of the IS organization and business units makes it tough to tell where one starts and the other leaves off, says Jim Metzger, general manager of Texaco's information

technology department in Houston. In other words, orderly and strict organizational lines are becoming a thing of the past as IS organizations try to become more nimble in responding to business needs.

NO TWO THE SAME

Because each company responds in different ways to the hot management themes of business alignment, team building and quality management, it seems that no two IS organizational charts look the same. Nevertheless, IS executives and consultants say a few common trends will be at work in 1994:

- **Flatter charts.** The general business movement toward flatter organizations is catching up with IS departments, says Cliff Hallberg, principal at Interpersonal Technology Group, Inc., an IS management consultancy in Rockville Centre, N.Y.

- **The IS function is no longer immune from [staff] downsizing,** so there are fewer boxes and fewer levels, Hallberg says. As a practical matter, that means fewer middle managers, fewer "assistant directors," less bureaucracy and relatively more hands-on technologists.

- **Skills are king.** Reducing the IS depart-

ment's head count means that staffers with multiple skills are highly prized. In fact, a revolutionary change is occurring: IS employees advance by adding new skills to their portfolios, rather than by moving up some vertical hierarchy or by seniority, Metzger says.

- **Teams are in.** IS departments are building multiskilled teams for particular projects — especially complex client/server systems — and then disbanding them. Notions of a strict chain of command go out the window when staffers are plucked from the organization chart and inserted into ad hoc, cross-functional teams.

- **IS people have to be more generalist** than they've been in the past. When you're thinning out the ranks, you need people to be more flexible and create teams as the need arises, says Philip Marzullo, chief information officer at medical equipment vendor Ren Corp. in Nashville.

- **New titles.** One result of all these business trends is that IS professionals are sporting a variety of titles not seen in the traditional data processing department, such as team leader, resource manager, quality manager, business process analyst and systems architect.

Perhaps the most dramatic change in the organization chart came from the continuing swing of the pendulum between centralization and decentralization of the IS function.

The IS function at Great-West Life Assurance Co. in Englewood, Colo., for example, has swung from one end to the other: "If you went back into the early 1980s, we were quite centralized and fairly monolithic in our organization. But then came a fairly drastic decentralization — predominantly of the application development groups," says Jens Pedersen, vice president of IS.

"Now we've decentralized to the point where we no longer recognize the position of a CIO," he says. "Each of our major lines of business has become so autonomous that the IS managers would probably think of themselves as the

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 - ☐ Comm. Network Sys. Mgr., LAN Mgr., PC Mgr.
 - ☐ Div. Mgr. Bus. Development, Sys. Architecture
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| <input type="checkbox"/> DOS | <input type="checkbox"/> U. DOS Windows | <input type="checkbox"/> |
| <input type="checkbox"/> LAN | <input type="checkbox"/> | <input type="checkbox"/> |
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The CIO position remains one of the hot seats in corporate America.

Deloitte & Touche's most recent study of CIO turnover found that the percentage of new CIOs rose 28%, from 14% to 17.5%. One-third of all CIOs who left their jobs were dismissed or demoted.

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Understanding of (business) issues	37%

WHAT DOESN'T

FACTORS THAT LEAD TO CIO TURNOVER
Respondent base: 323 health care CIOs

Not productive/Exceeding budget	64%
Lack of business/management skills	48%
Lack of communication skills	41%
Not understanding organization	38%
Unrealistic expectations	37%

Source: Collection of Healthcare Information Management Executives Association, March, November/December, 1989.

ture does not give them clear, unambiguous missions and incentives. For example, he says, many IS organizations make the mistake of dispersing applications developers to the business units and asking them to be both technologists and strategic business consultants. The result is that neither mission is carried out.

The two missions should be split, Meyer says, with a centralized group of technologists supplying the technical expertise and a group of consultants dedicated to helping each business unit exploit the technology. "Consultancy is a full-time job, not something to be done by technology managers in their spare time," he says.

IN-HOUSE SPECIALISTS AT YOUR SERVICE
The Tennessee Valley Authority (TVA) in Knoxville has already begun to implement this sort of new-wave IS structure. The TVA found that having IS units devoted to each business unit spread the staff expertise too thin and created redundant, incompatible systems.

So the TVA created a central pool of technical specialists, essentially in-house subcontractors for IS development projects anywhere in the agency. Separate from these technologists is a new group of business-oriented consultants who can suggest IS applications without any bias toward one technology or another, says Robert L. Yates, vice president for information services.

The emphasis is on using the organizational chart to clarify roles and eliminate conflicts of interest. For example, the TVA's recent reorganization creates "service bureaus" to handle the data center, network operations, PC user support and IS administrative functions. A new office of "information technology architects" oversees corporatewide technology standards. While the swinging of the pendulum between centralization and decentralization ever settle down? Hallberg sees no evidence that it will.

"This is not some transitional period to level ground. This chaos is going to continue for a long time," Hallberg says, suggesting that IS executives can expect to be redrawing their organization charts for years to come.

CIO for each business line."

Companies such as Great-West Life decentralize to bring IS folks into closer contact with the business units they serve, but some companies find they cannot abide the loss of data standards, systems integration and economies of scale, so they recentralize or invent some blend of the two.

Take the case of Texaco, which has done all three. In 1988, Texaco decentralized applications development and systems budgets and shipped them out to the autonomous business units, Metzger says. Then in September 1992, Texaco recentralized the operation and support of client/server systems.

Now Texaco has an IS committee, which Metzger chairs, made up of all of the IS directors in the business units, and they jointly manage the company's overall IS efforts.

Computerworld's Forecast survey of IS executives finds three-quarters saying their departments are centralized, but there is substantial adoption of alternative structures, too. The survey indicates that 17% of IS organizations are decentralized, 13% are organized around business lines or functions, 12% are or-

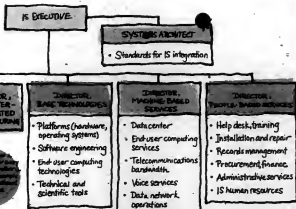
ganized in to teams and 11% are geared to key business goals.

Some might wonder whether the organizational chart really matters, figuring that a charismatic leader and a well-motivated staff can get the job done regardless of how the boxes are laid out.

But N. Dean Meyer, president of IS management consultancy NDMA, Inc. in Ridgefield, Conn., contends that the organizational chart can spell the difference between IS success and failure.

Meyer argues that even the best employees will be set up to fail if the organizational struc-

DECENTRALIZATION
To the mass is now a way of life for John Pedersen, vice president of IS at Great-West Life. IS managers in each business line are autonomous (they function like CIOs).



Should never be outsourced

SOURCE: ADAPTED FROM STRUCTURAL DYNAMICS BY N. DEAN MEYER AND ASSOCIATES, INC., RIDGEFIELD, CONN.

We didn't say COBOL is the best in the



PC SOFTWARE
BRAND
PREFERENCE

DOS-BASED
CASE

ADDITIONAL 101 RESPONDENTS
On-line: 11 high brands of DOS-based
& 194 software are currently installed in
larger organizations?

INSTALLED IN COMPANY

KnowledgeWare, Inc. (Information Engineering Workbench)	42%
MicroFocus (Workbench)	40%
Intersoh (Excelerator)	15%
Texas Instruments (Information Engineering Facility (IEF))	13%
Computer Associates (CA-Tellon)	7%
Computer Associates (CA-REALIA)	6%
Intersoh (VSDesigner)	3%
Sybase (SQR Workbench)	2%
Cadre Technologies, Inc. (Teamwork)	1%

EASY TO USE

MicroFocus (Workbench)	38%
KnowledgeWare, Inc. (Information Engineering Workbench)	17%
Intersoh (Excelerator)	9%
Computer Associates (CA-REALIA)	8%
Visible Systems Corp. (Visible Analyst Workbench)	8%
Texas Instruments (Information Engineering Facility (IEF))	4%
Cadre Technologies, Inc. (Teamwork)	3%
Intersoh (4Front)	2%
Sybase (SQR Workbench)	2%
Other	17%

BEST TECHNOLOGY

MicroFocus (Workbench)	29%
Texas Instruments (Information Engineering Facility (IEF))	26%
KnowledgeWare, Inc. (Information Engineering Workbench)	24%
Computer Associates (CA-REALIA)	5%
Cadre Technologies, Inc. (Teamwork)	3%
Intersoh (Excelerator)	3%
Computer Associates (CA-Tellon)	2%
Sybase (SQR Workbench)	2%
Other	10%

BEST PRICE/ PERFORMANCE

MicroFocus (Workbench)	30%
KnowledgeWare, Inc. (Information Engineering Workbench)	14%
Intersoh (Excelerator)	11%
Texas Instruments (Information Engineering Facility (IEF))	11%
Computer Associates (CA-REALIA)	5%
Visible Systems Corp. (Visible Analyst Workbench)	5%
Cadre Technologies, Inc. (Teamwork)	3%
Sybase (SQR Workbench)	3%
Other	19%

We've always believed Micro Focus COBOL Workbench® is the best in the world. Now you've confirmed it by unequivocally placing it first in the 1993 Computerworld PC Software Brand Preference survey.

You voted COBOL Workbench as **Best Technology** and **Easy to Use**. That's not all. Workbench also won top honors in

Price/Performance, Best Documentation, Plan to Buy, and most importantly, you chose Micro Focus as the company you **Prefer to do Business With**. According to you there was no contest.

Not surprising really. There is no better technology for developing new systems or



BEST TECHNOLOGY

BOL Workbench world. You did.

Question: For each of the DOS-based CASE software listed, please indicate which company you most closely associate with each characteristic:

- Easy to use
- Best technology
- Best price/performance
- Best service/support
- Best documentation
- Prefer to do business with

Question: Which brand of DOS-based CASE software are likely to be purchased during the next 12 months?



BEST SERVICE/ SUPPORT	
KnowledgeWare, Inc. (Information Engineering Workbench)	26%
MicroFocus (Workbench)	26%
Texas Instruments (Information Engineering Facility (IEF))	19%
Intersolv (Exaccelerator)	10%
Cadre Technologies, Inc. (Teamwork)	3%
Computer Associates (CA-REALIA)	3%
Sybase (SQR Workbench)	3%
Other	10%

BEST DOCUMENTATION	
MicroFocus (Workbench)	34%
KnowledgeWare, Inc. (Information Engineering Workbench)	31%
Intersolv (Exaccelerator)	10%
Texas Instruments (Information Engineering Facility (IEF))	7%
Computer Associates (CA-REALIA)	3%
Sybase (SQR Workbench)	3%
Other	10%

PREFER TO DO BUSINESS WITH	
MicroFocus (Workbench)	28%
KnowledgeWare, Inc. (Information Engineering Workbench)	23%
Texas Instruments (Information Engineering Facility (IEF))	19%
Intersolv (Exaccelerator)	6%
Computer Associates (CA-REALIA)	4%
Computer Associates (CA-Tellon)	4%
Sybase (SQR Workbench)	2%
Other	15%

PLAN TO BUY	
MicroFocus (Workbench)	30%
KnowledgeWare, Inc. (Information Engineering Workbench)	29%
Texas Instruments (Information Engineering Facility (IEF))	16%
Intersolv (Exaccelerator)	3%
Cadre Technologies, Inc. (Teamwork)	3%
Computer Associates (CA-Tellon)	3%
Programmed Intelligence Corp. (Intelligent Query)	3%
Other	18%

re-engineering existing applications on the workstation. Programmers find Workbench puts them directly in control of their development environment, delivering quality business applications on time and on budget.

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ENABLING TECHNOLOGIES

Holding it all together

Users get creative in applying communications to bind buyers and suppliers

BY MARK HALPER

THE EMERGENCE OF "GLUE" technologies, such as electronic mail, enhanced electronic data interchange (EDI) and electronic bulletin boards, is not only enabling companies to tie together far-flung national and global offices but is also enhancing customer-to-supplier communications.

Now that electronic interchange of invoices and purchase orders has become common, firms are finding other ways to tighten the link to trading partners.

One tactic that is gaining ground is the sharing of databases with suppliers and corporate collaborators, says David Taylor, vice president of electronic commerce at Gartner Group, Inc., a consultancy in Stamford, Conn. "When you're building something big like a Boeing 747,

where many companies participate—and a change to one component affects other components—it really helps if they all can have real-time access to a shared database." In fact, Taylor notes, Boeing is using such a shared database for construction of its new 777 aircraft.

GLOBAL DATA SHARING

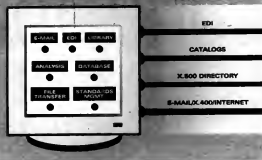
Nike, Inc. carries information sharing even further—all the way to Korea. The Beaverton, Ore., shoe and apparel manufacturer sends production data from a home-office database to subcontractors in that country via TCP/IP connections, according to Torrey Byles, an analyst at Input in Mountain View, Calif.

"We're seeing this kind of thing a lot in the manufacturing, high-technology and apparel industries," Byles observes. Similar connective strategies are also being employed in retailing. Wal-Mart Stores, Inc. in Bentonville, Ark., provides its suppliers with decision-support software that has access data stored on a Wal-Mart Teradata Corp. machine in Bentonville. With this tool, suppliers are able to stay abreast of how their products sell at stores in different markets.

"There's a lot of things we're doing that go beyond traditional EDI," says Wal-Mart strategy manager Charlie McMurtry. "We believe strongly in sharing information and technology with our vendors."

Connection engine

Integrated Electronic Commerce Workstations similar to the one shown are starting to find their way into business.



SOURCE: GARTNER GROUP INC., STAMFORD, CONN.

Gordon Kerr, senior vice president at Hyatt Hotels Corp., says the need for vendor-to-customer communication technology is so universal that industries should cooperate in developing standard mechanisms.

"Right now, as a country, we're not good at those cooperative efforts," Kerr says. "People are always running around

trying to reinvent the same systems."

But Kerr also cautions about getting caught up in the euphoria about technology's potential to cement relationships and hold together far-flung alliances. "Technology as glue is the kind of aphorism people use in boardrooms to justify a \$20 million network or a \$40 million distributed system project," he says. ■

Where the jobs are

WHAT DO EMPLOYERS WANT? A LOT

"I'd like someone who can program in dBase, handle network support in a Novell environment, has a basic understanding of data communications, wide-area networks, and who can use Windows in a networked environment."

HOWARD STODOL, IS MANAGER,
QUEST MGMT. SERVICES & TRAINING,
AL FORD, TEXAS



"CASE tools, client/server environments, SQL server environments and knowledge of distributed applications."

JOHN STEVENS, SYSTEMS MANAGER,
SHALLCROSS SERVICES INC.,
ELIZABETH, N.J.

Big demand + small supply opportunity

Smart server developers
2-3 programmers specializing in business applications
Programmer Analyst with EDI experience
SQL analysts
DB2 programmers analysts with database administration experience
OS/2 programmer analysts
Network administrators with Novell LAN Server Token Ring and Ethernet experience

ADJUSTING TO THE TIMES:



"It used to be that when you were beeped at 2 in the morning, you knew where to look for the problem—it was in a single option that you could rip apart. Now, it's more of a networking and communications problem. Involving much more detective work."

RONALD KEITH BUNKER,
DATABASE ADMINISTRATOR,
LAWRENCE COOPERATIVE PUBLISHING,
ROCHESTER, N.Y.

To do and not to do

Network and data center personnel were asked what skills to emphasize and de-emphasize

PERCENT OF RESPONDENTS

PAY MORE ATTENTION TO:

Performance metrics **40%**
Disaster recovery **29%**

PAY LESS ATTENTION TO:

Ordering of network operating systems, bridges, routers, wiring **36%**
Implementation **36%**

PAY MORE ATTENTION TO:

Gateway management **80%**
Network operations **60%**

PAY LESS ATTENTION TO:

DBMS index selection **22%**
DBMS help desk support **21%**

BASE: 128 INFORMATION SYSTEMS PROFESSIONALS
SOURCE: GARTNER GROUP INC., STAMFORD, CONN.

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FORECAST '94: The Disorganization Chart

THE EVOLVING ENTERPRISE

"BUSINESS IS NO MORE AS USUAL"

Corporations are depending on IS to help them adapt

BY ALLAN E. ALTER

IT'S NO FLUKE THAT THE BEST-selling business book in 1993, *Reengineering the Corporation*, was written by a couple of consultants previously known only to information systems professionals.

Unlike the boom years of the 1980s, when speculators such as Ivan Boesky and Donald Trump became best-selling authors, the 1990s are a time of harsh realities such as sluggish economic growth. As Citicorp Chairman John Reed told a Boston audience recently, most companies can no longer expect to boost their bottom line by expansion. Instead, they must do it by achieving operational excellence at minimum cost.

This is what re-engineering, and other approaches that businesses are pursuing, promise to deliver.

SLASH CYCLE TIMES

Companies are slashing the time required to take a product from concept to finished goods and from the factory floor to the store.

Consider: A couple of years ago, a new car model was the end result of a 48- to 50-month process. Now some automakers, such as Ford Motor Co., have whittled the interval down to 24 to 36 months. And retailers such as Wal-Mart Stores, Inc. and Kmart Corp. now routinely ask suppliers to replenish their shelves in three to five days instead of three to five weeks.

Accelerating product development has been the focus of re-engineering efforts in the pharmaceuticals industry.

Service providers are also keenly interested in cycle time reduction. Federal Express Corp. has even funded a new academic center devoted to the study of cycle time reduction at Memphis State University in Tennessee.

DELIGHT TOUGH CUSTOMERS

Quality has come to be defined not just as zero defects, but as meeting or exceeding customer requirements. In total quality management jargon, that's called "delighting the customer."

But customers are getting tougher to delight. Quality and responsiveness are no longer sufficient.

For example, major corporations are whittling their supplier lists and demanding more from those that make the cut.

In the retail sector, product suppliers are now sometimes expected to monitor and manage their own inventories. Ivars "Ike" Elshvalds, director of IS at Scotch Maid, Inc., a manufacturer of women's exercise clothing, says he expects that by mid-1994, Scotch

SUPPLYING PRODUCT ISN'T ENOUGH ANY MORE. Ivars Elshvalds of Scotch Maid says retailers will soon ask manufacturers to shoulder responsibility for keeping shelves full.

Maid, not Wal-Mart, will be responsible for making sure there are adequate supplies of its apparel on store shelves.

TIGHTEN LINES

Speed and quality require close coordination between companies. Just as manufacturers are creating teams of employees with different skills and functional backgrounds, companies are also handing together to achieve common goals.

For example, Joseph Frielan, manager of supplier communications at Ford, says the automak-

er's suppliers participate in "the total production cycle, from design through manufacturing."

Why is all this happening now? After all, there's nothing new about downturns in the business cycle or the cutthroat competition they spawn. What makes things different this time is the existence of information-delivery technologies that redefine possibilities.

The information needs of the 1990s have brought profound and sometimes painful changes to the IS profession. But considering how companies have come to rely on information technology to enable operational excellence, IS is mainly a victim of its own success. ■



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 - 80. Communications Systems/Software/Services/Transportation
 - 90. Manufacturing/Computer/Processing/Technology
 - 00. Agriculture
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- MANAGER MANAGEMENT**
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 - 20. Chief Financial Officer
 - 30. Chief Marketing Officer
 - 40. Chief Operations Officer
 - 50. Chief Technology Officer
 - 60. Chief Human Resources Officer
 - 70. Chief Information Officer
 - 80. Chief Legal Officer
 - 90. Chief Security Officer
 - 00. Other _____ (Please Specify)
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- 10. President/Chief Executive Officer
 - 20. Vice President/Chief Executive Officer
 - 30. Treasurer/Controller/Financial Officer
 - 40. Chief Financial Officer
 - 50. Chief Marketing Officer
 - 60. Chief Operations Officer
 - 70. Chief Technology Officer
 - 80. Chief Human Resources Officer
 - 90. Chief Security Officer
 - 00. Other _____ (Please Specify)

- DEPARTMENTAL MANAGEMENT**
- 10. Sales & Marketing Management
 - 20. Medical/Legal/Accounting/Mgmt
 - 30. Education/Research/Development/Support
 - 40. Engineering/Architecture/Design
 - 50. Chief Information Officer
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 - 60. Government (State/Federal/Local)
 - 70. Communications Systems/Tools/Utilities
 - 80. Hardware
 - 90. Manufacturer of Computers/Computer Peripherals/Systems or Peripherals
 - 95. Systems Integrators/VARs/Computer Services/Business Software Planning & Consulting Services
 - 99. Other _____ (Please Specify)
- 2. TELECOMMUNICATIONS (Circle one)**
- MANUFACTURING MANAGEMENT**
- 18. Chief Information Officer/VP President Asst. of MANUFACTURING
 - 21. Chief Information Officer/Information Center
 - 22. Div. Mgr. Tech. Planning Asst. (Govt.)
 - 23. Div. Mgr. Control Network Sys. Mgr. LAN Manager/PC Manager
 - 24. Div. Mgr. Sys. Development Sys. Architect/Developer
 - 31. Programming Management Software Developer
 - 41. Engineering Scientific R&D Tech. Mgr.
 - 60. Sys. Integration/VAR/Consulting Mgr.
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- 11. President, Owner/Partner General Mgr.
 - 12. Vice President Asst. VP
 - 13. Treasurer Controller Financial Officer
- DEPARTMENTAL MANAGEMENT**
- 14. Sales & Mktg. Manager
 - 15. Finance Mgt. Accounting Mgr.
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 - 80. Educator/Instructor/Instructor Student
 - 90. Other (Specify Personnel)
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PLATINUM
SOFTWARE CORPORATION

End users won't wait

Give 'em what they want — or they'll get it from somebody else

BY THOMAS HOFFMAN

H E THOUGHT HE HAD IT ALL figured out. In 1984, Chief Information Officer M. Lewis Temares and his information systems staff at the University of Miami embarked on a six-year, \$15.2 million IS overhaul designed to provide university departments with integrated database management systems. But not long after the project was completed in 1990 — \$500,000 under budget — Temares learned from end users that the new systems didn't meet their information tracking requirements. "Some users were happy, but a lot of users weren't," Temares says.

The problems Temares and his crew faced aren't unique. End users' expectations are rising, and as a group, they are feeling both more confident and more willing to criticize IS performance.

Listen, for example, to Kathylyn O'Donnell Galbraith, an executive vice president responsible for global capital markets at the Chase Manhattan Bank N.A. in New York: "I'm not interested in how the feeds are made and what the equipment consists of," she says. "I just want the information to be there."

And then there's Doug Lawson, an assistant vice president of service management at CSX Corp. in Jacksonville, Fla. According to Lawson, who acts as a liaison between IS and end-user departments, "There's been some frustration here in the end-user community. The technology de-



partment has been mainframe-oriented, and its support of users hasn't been that active."

Being responsive to users' complaints isn't just a nice thing to do anymore. It's becoming a matter of survival. In many companies, particularly the larger ones, business departments are gaining greater control over their information technology spending. According to Joseph Zinkin, senior manager for the center for information technology and strategy at

HANGING ONTO USERS It easier if they're friends. M. Lewis Temares (left), CIO at the University of Miami, and Rosemarie Thomas, assistant vice president of human resources, know how to work out their differences amicably.

Ernst & Young in Boston. As this happens, many are deciding they'd rather throw their money to outside vendors.

Gartner Group, Inc., a Stamford, Conn., market research firm, recently found evidence of this trend in a survey of Fortune 500 IS executives. According to Gartner Group, in 1993, these companies allocated 35% of their IS budgets to decentralized systems to support their business units but expected that decentralized departmental



spending would account for 55% of the total by 1998.

In defense of IS, end users' expectations aren't always realistic, and they aren't always seeing the whole picture. "If we can get people to use the solutions that are already out there, maybe they can use those tools without us having to reinvent the wheel," says Eugene H. Friedman, a vice president of corporate technology and information services at Chase.

SEEKING FOR THEMSELVES

To help in this regard, Chase held a technology expo last March at its Brooklyn, N.Y., Metrotech data center. More than 6,000 users viewed and demonstrated 35 companywide applications, from image processing systems to customer services software modules.

Rosemarie Thomas, an assistant vice president of human resources and an end user at the University of Miami, says users often get what they ask for but don't always know, at the outset, what it is that they really need. "Users may look at their needs from a very provincial point of view," he says.

In addition to a communication gap, there is also a resource gap that frequently prevents IS departments from giving user departments the kind of support that's now expected. "On the technology side, there's been a concern about the demand against their operating resources. [IS] has no way of knowing or predicting when they'll be hit with hundreds of inquiries at once," Lawson said.

To stretch available resources

PEOPLE TO WATCH

► Paul Brenner, Baxter Healthcare Corp.

Vice President of Information Technology Brenner's 1994 IS budget request is \$6 million smaller than the one submitted for 1993. And he's smiling. Less layers make for leaner operation, and Brenner has collapsed the IS pyramid at Baxter so there are now only four levels between entry-level programmer and CEO. He has created functional groups organized by expertise and empowered to create self-directed, cross-functional work teams to address project needs. This setup gives IS staff more latitude but forces team effort. Performance ratings are based on individual work and team performance.



BRENNER

► Larry Runge, Wheels, Inc.

CIO Larry Runge wants his 80 IS staffers to think like Viking explorers, who followed a leader only as long as he made sense. Not that Runge is planning on going anywhere; he's been at Wheels for only 11 months. But he's already shaking up structures. Two levels of directors and managers are now one layer of what he calls "patrons of the arts" — people who provide the tools, financial support and guidance that staffers need. Does it work? You be the judge: In seven months, Runge's group has produced a new vehicle remarketing system for one-tenth the cost of what a similar system cost a competitor.



RUNGE

► Gary Osborne, Hughes Space & Communications Co.

Let's just say Osborne likes a challenge. While paring his 250-person IS staff to 100, this CIO is also undertaking a project to connect a Sybase DBMS used for decision support with Ingres and Oracle DBMS that support resource management and product data applications. Each project manager has in-house and vendor staffs reporting to him so the in-house IS group stays in control of its domain but has vendor personnel ready to provide training and support. In a few instances, the company will turn over an entire project to the vendor, with Hughes' staff reporting to it.



OSBORNE

FORECAST '94: The Disorganization Chart

further, the IS units at CSX are exploring ways to make end users more self-sufficient. These include deputizing end users to train other end users on systems and providing graphical tools that give users easier access to data.

Union Pacific Railroad in Omaha is also giving graphical front-end tools a try. That company recently began outfitting users in its financial services department with PowerSoft Corp.'s PowerView and Microsoft Corp.'s Visual Basic software to ease data extraction.

"What we're trying to do is take the data off the mainframe, put it on a Unix platform and give users a dedicated data administrator to normalize and extract the data for them," says Mark Davis, Union Pacific's director of data management.

BUILDING SOLID RELATIONS

Still, IS departments will need more than graphical user interfaces and help desks to cement their relationships with end users down the road.

"As companies downsize to meet economic imperatives, IS must change its role to meet these changing information technology requirements," says Bill McNea, vice president and general manager at Gartner Group's Software Asset Management Service.

Many of the functions that IS departments once controlled are going by the wayside as end-user departments take control of their own information technology projects, McNea says. Though IS will continue to be responsible for systems and configuration management, these

units will have to decentralize in order to forge closer bonds with end users. As this happens, McNea foresees the IS role evolving into that of a consultant or "gatekeeper" to help end users pick and choose suppliers.

PUTTING IT INTO PRACTICE

That's already happened at the University of Miami, Temares says. For example, the university's IS staff usually designs all the LANs to be implemented across the campus but relies on outside vendors for installation. So when an end-user department needs a new LAN, the university telecommunications team will review their needs and work up a bid for competing vendors, Temares says.

To solve its end-user data access dilemma, the University of Miami IS staff set up a data administrator in 1990 to determine the limitations of access between end users and departments. In addition, the IS department has been steadily implementing IBM OS/2 LANs across different departments to provide cross-business unit data access, with LAN projects scheduled there through the remainder of 1994.

Close-knit, long-term bonds with peers managing user departments can do a lot to ease tensions, too. Temares and Thomas, for example, have known each other for 13 years and have developed considerable respect and trust for each other.

"My staff has problems with people reporting to Lew from time to time, but we work it out," Thomas says. "It really pays to have that relationship solidified at our level."

	1992	1993
Project management	13.8%	30.7%
Help desk	16%	32.8%
PC/Workstation configuration	17.3%	33.5%
Strategic planning	22.6%	42.6%
Software support/integration	29.8%	48.5%
Custom application development	31.5%	49.3%

SOURCE: DATARESET INC. PROFESSIONAL SERVICES TRENDS USER WANTS AND NEEDS STUDY (JUNE 1993)



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Crunch! An Industry Restructures

WHAT'S THE DIFFERENCE BETWEEN A competitor and a business partner? It depends on who's making the sale. Whether it's called 'cooperation,' 'strategic alliance' or 'all-out war,' the old barriers that separated friends from foes no longer apply. The once undisputed leaders are laying off tens of thousands of people and bleeding red ink. Leadership has passed into the hands of techie millionaires and venture capitalists. We take our best shot at helping you decide who's up, who's down and who's going underground.

IN THIS SECTION

Tough times are forcing vendors to shed unprofitable products, to the dismay of some customers.

PAGE 33



500 channels? That's just the beginning. There's gold in communications — computer convergence — if you live long enough.

PAGE 34



Ten small companies you'll be hearing more about.

PAGE 35

NEW WORLD ORDER

The IBM of the '90s?

Microsoft and Intel are the new kingpins of computing. Are they fit to rule?

BY ED SCANNELL AND
MICHAEL FITZGERALD

NOW THAT MICROSOFT CORP. and Intel Corp. have pried IBM's grip from the throttle of technological change, the big risk is that they'll make IBM's mistake of enjoying their success too completely.

Fueled by the phenomenal acceptance of PCs in corporations, the Microsoft/Intel axis dominates more than 85% of all desktops. Intel says it sold some 30 million chips just in the 1486 market in 1993. Microsoft, meanwhile, cranks out more than a million copies a month of Windows alone. With that kind of share and profitability levels that approach the absurd, some people are saying the two companies have replaced IBM as the computer industry's 2,000-pound gorilla.

"Microsoft and Intel" are setting the agenda for the industry at the current time," says Sheldon Laibe, national director of infor-

mation and technology at Price Waterhouse.

Nonsense, the two vendors say. "The role that IBM played is a role that nobody will ever play again in this business," says Dave House, Intel's senior vice president of corporate strategies. "Us sitting on a throne is a gross exaggeration. We're much more like leaders of Congress, [who derive] power from being able to set directions and then convince other freeminded people to go in that direction."

HEALTHY PARANOIA

Then again, according to House, Intel's motto is: "Only the paranoid survive."

Paranoia may be the right term for Intel and Microsoft, which seem pushed by a passion that is uncommon among the lavishly successful. The two are trying to leverage their installed base of compatible software and hardware to extend their dominance into the emerging world of client/server computing with Microsoft's

Windows NT operating system and Intel's Pentium chip.

That will be a tough act to pull off. Whereas IBM dominated the '70s and '80s with proprietary hardware and software, Microsoft and Intel must establish a standards that users increasingly ask be open, not de facto.

PERCEPTION VS. REALITY

Both companies talk about working and playing well with others. But many experienced information systems managers and competitors see only a couple of wolves in sheep's clothing.

"Microsoft is doing the same sort of things IBM did 20 years ago. It is unilaterally setting standards through sheer volume and the force of its will," says Bob Holmes, manager of systems evaluation at Southern California Gas Co.

Bill Lodge, a project leader at The Turner Corp., a multinational construction company, says that for better or for worse, Turner is "married" to Intel's architecture

for its client/server directions.

Microsoft has been paying at least lip service to openness of rule. Over the course of 1994, Microsoft is expected to adapt its technologies to some open standards, including the X.509 messaging protocol, the Object Management Group's Common Object Request Broker Architecture standard and the Open Software Foundation's Distributed Computing Environment.

"It is a different world out there, and this new [computing] model has yet to be fleshed out. We will have to work with a variety of people to set architectural standards," says Steve Ballmer, Microsoft's executive vice president of worldwide sales and support.

But many observers remain skeptical that Microsoft is really opening up. For example, the company has made no public effort to work with the Common Open Soft-



ILLUSTRATION: PHILLIP BURR

“WHAT WE ARE WITNESSING IS THE TURMOIL CAUSED BY A PHENOMENALLY CREATIVE INDUSTRY CONTINUING TO BE RIPPED APART BY THE GREEDY AND SELFISH USERS. DAMN THEIR EYES.”

ROBERT YOUNG
EDITOR
NEW YORK UNIX MAGAZINE



its chips to everything from palmtops to massively parallel computers but has little direct experience with information systems issues.

Users, though, say that as long as important business software runs on Intel's chips, the company does not need a presence in IS.

"Most companies are not going to want to stray from what's the mainstream," says Glenn Sandusky, chief information officer at Aon Specialty Group, a consulting company in Chicago. "The best technology is not always the [best] decision."

COMPETITION FOR INTEL
However, some analysts say they see a chance for Intel to slip.

"Intel for the first time will be seriously challenged by the PowerPC, which can take a bite out of Intel's desktop share. The only question is, how big will that bite be?" says Will Zaehmann, president of Canopus Research, Inc., a consultancy in Hingham, Mass.

While everyone focuses on Microsoft and Intel, a dark horse is emerging. Some people believe IBM still has a chance to be the "IBM of the 90s."

In its attempt to reinvent itself, the company appears to be making a more aggressive attempt to set open standards than Microsoft.

It is an active participant in the OpenPc and COSE consortia and continues to support joint hardware and software ventures with Apple and Motorola.

"What IBM is doing is leading Microsoft to set the standards for the next generation of products. I think that is what Taligent [the IBM/Apple/object-oriented operating systems project] is all about," says John Dunkle, vice president at WorkGroup Technologies, Inc., a market research firm in Hampton, N.H.

IBM lost its standards-enter status when it failed to ebook its gap at the open systems door. Observers say that to succeed, Microsoft and Intel must make sure they don't make the same mistake. ■

ware Environment's (COSE) efforts to create an open standard for interfaces. Nor has it been as cooperative as it could be in opening up its Messaging Application Programming Interface technology, some say.

STANDARDS DANCE

Intel, meanwhile, has joined standards groups such as the Video Electronics Standards Association and Personal Computer Memory Card International Association, only to later develop its own, competing standards.

In the client/server markets, Intel will have to compete against deep-pocketed companies such as the IBM/Apple Computer, Inc./Motorola, Inc. venture, Hewlett-Packard Co. and Digital Equipment Corp., all of which have their own chip architectures.

Intel has started a fledgling client/server computing unit and has

HYPER WARS

NEW! GREAT! LATE!

Not having a product shouldn't stop you from issuing the press release

BY JAMES DALY AND KIM S. NASH

What do Windows NT, the information superhighway, Oracle Corp.'s Oracle 7 and the separation of Chuck and Di have in common? They were all talked about long before they actually happened.

But whereas Britain's royal split made for little more than a tabloid diversion, information systems managers sometimes put their jobs on the line based on over-hyped projections, promises and strategy statements about next-generation technology.

"Unfortunately [vendor] hype is a way of life," says Brian Conner, manager of the information center at IRI, Airways, Inc. in Redwood City, Calif.

For example, Oracle Chief Executive Officer Larry Ellison began expounding on the planned features of Oracle 7.0 more than 2½ years before it shipped earlier this year. Many Oracle customers say they expect that sort of behavior from Oracle and factor it into their plans.

Companies known for lofty talk say they are helping users plan ahead. Critics counter that those firms try to lock out competition by preannouncing technology that is nowhere near delivery.

"That's the line you walk [when talking about the future]," says Peter Kastner, an analyst at Aberdeen Group in Boston.

But sometimes hype can backfire. For example, Apple Computer, Inc. spent so much energy hyping the Newton personal digital assistant that many folks thought the company took its eye off the ball.

"Right now, Apple is going in way too many directions at once," says Eric Jon, manager of IS at BC Hydro in Burnaby, British Columbia.

With that experience in hand, Apple has better coordinated the arrival of the PowerPC-based Macintoshes by issuing clear statements about which machines would be upgradeable to the new line and when.

Users say they are wary of vision statements. "Whenever I see a 'promise' pushed by vendors, it scares me," says Chuck O'Leary, a consultant at Modisette Associates, a Houston software implementer.

For hype-weary users, there's little relief in sight. The reason: Very often, hype works.

Consider object-oriented databases. Oracle, Sybase, Inc., Informatica Systems, Inc. and others have begun talking up object plans at the expense of competitors. "Users see no reason to buy from a tiny, unknown object company if they can wait, safe and warm, for Oracle to get [them] to where they want to go," Kastner says.

DAVID CONNOR'S "PC LETTER" VAPORWARE HALL OF FAME

- The notorious Microsoft's Windows was announced in November 1985 but didn't ship until November 1989. Windows NT spent 30 months on the list before shipping last July.
- Letter's 1-3-3 Marathon 3.0 spent a year on the list following its June 1988 announcement.
- The ill-fated Lotus's Notebook's Blueprint 4.0 spent 18 months.
- LORNET 3.0 was never an official drive from Verbatim, which was listed for more than three years during the late 1980s.
- SATV 80000 Some companies actually like to be on the list, figuring it's good publicity. Source: "PC Letter."

LEADERS and LAGGARDS



An irreverent look
at who does what, where and
why, who's bold, who's cold
and who's likely to get rolled

PC software

PC hardware

Networking

Multuser hardware

Client/server

TRENDSETTERS

Microsoft Corp. Trendsetter seems too weak a word for a company that can tilt the water it walks on. The new icon of U.S. business is its own best critic and never conceals a market. May even nail networking with an OEM strategy for Windows for Workgroups and NT. **Peoplesoft, Inc.** Aggressive marketer. Actually makes client/server financial applications that user companies want.

Compaq Computer Corp. Compaq got its ego handed to it in 1992 but now walks its talk, as huge growth rates put it in sight of IBM's No. 1 market position. Groundbreaking server effort in ProLiant and macho product development partnerships should keep it moving. **IBM PC Co.** If you can't build it, will they keep coming? Like breaks both records and IS project schedules with great products it can't ship. Best technology of any hardware maker.

Novell, Inc. Hey, Ray or no Ray, it's Novell, and it's also moving to improve enterprise services with AppliWare in a client/server application development situation. **IBM/Novell-Packard Co.** These two understand enterprise networking management better than anybody else, and that old-line vendor guise may mask wisdom that can help large firms move to enterprise-wide client/server.

IBM. Go ahead, sneer, but when IBM sneezes, it spreads a lot of germs. HP: Five years ago, HP was in the Top 5 most profitable computer companies. Today, it's the only one still on the list. HP put its chips behind Unix early on and still reaps the benefits, despite older hardware problems. **Univac Corp.** The blue bell big iron makes flush with sustained profitability, leads big mainframe makers in move to cheaper CISC-based technology and MPP.

Oracle Corp. Take equal parts dust and marketing, mix with solid installed base, and who cares if the technology is not the sexiest? **Intel Corp.** So far, competition hasn't punctured profits as Intel reshapes itself to stay ahead in the race. Well-positioned to sell multiple chips per system. **HP.** Established best strategy of the big companies for bringing people down from old systems. Aggressively marketing Unix in place of mainframes.

CONTENDERS

WinPerfect Corp. E-mail applications are solid. Word processing lags former leader, though, as its Windows product gets a mixed reaction. Its safe spot with **Portland International, Inc.** could develop broken string.

Next Computer, Inc. OK, so Steve Jobs shouldn't have tried to build the next Macintosh, but NextStep for Intel equals an operating system. It could be a dark horse.

AST Research, Inc. Orange County's PC maker seems too influenced by the land of Disney. Maybe Tandy Corp.'s Texas blood will help AST leverage pioneering efforts in branding strategy and diversification. **Apple Computer, Inc.** Proud-and-paying-for-it unicorn maker appears ready to find its way out of the proprietary wilderness, but can it stand being out in the open? It garners financial support from its installed base, but PowerPC and the coming open software gambit may be too little, too late.

Bayport Systems, Inc. Though it was first to work toward expanding directory and other services beyond its own environments, users tend to lose this tree in the forest.

Cisco Systems, Inc. Aggressive, but its router architecture lacks the oomph needed to go to next-generation networking. **SynOptics Communications, Inc.** The smart hub/ATM switch company has grabbed its market share lead back from Cabletron Systems, Inc.

Digital Equipment Corp. So far, Robert Palmer's haircut is the best thing about life after Ken Olsen. The company gets points for trying: Witness Alpha AXP's principled insistence and its early embrace of Windows NT. But Digital is a go-go weakling in commercial Unix, and Alpha is struggling. **Beta General Corp.** Here the U.S. Data Sergeant but has built its Avion systems line into something of interest to key Unix software vendors. Multiprocessing support an advantage.

Sun Microsystems, Inc. Always a force to be reckoned with, it needs to figure out how to harness its installed base and application software and ride those. Instead of its hardware line. **NEC Corp.** Negative cash returns make it a profit alibi for corporate parent AT&T, but commercial Unix is a bright spot. It's the first old-line vendor to convert completely to Intel architecture.

ALSO RANS

IBM Personal Software Products in the PC software race, IBM has typically run like a dead horse, but repeated beatings may have it back to life. Recent progress on OS/2 and its forthcoming Workplace OS and Telligent operating environments could move it up to contender status. **Barclay** Struggling to get products out and make its objects desirable to IS. The \$49.95 Quattro Pro price promotion is a bold gambit, but it's seen more as desperation than an innovation.

Dell Computer Corp. Desktop volumes are nice, but the young gunslingers in Austin, Texas, shot off one foot with a failed notebook strategy and the other with distribution problems caused by peil-mell growth. Still, if the market is strong in '94, Dell might be able to rise. **About gas dies engine:** Life under a microscope is proving uncomfortable for everyone you've never heard of. They will fight for their lives, under pressure from the Big Two.

Microsoft. Redmond's armor has two chinks: Chairman Bill Gates' suity and networking. Neither is hopeless. LAN Manager may get hotter, thanks to Microsoft's determination to get everything right. Advanced Server needs to be more than LAN Manager for NT; stay tuned in 1994. **Sun:** Surly management is less than proactive here. Maybe that's why Sun is the only major SAMP player on the sidelines of the IBM/Digital/HP alliance.

Amdahl Corp. Finding itself swamped by low tide, as mainframe demand wanes. **Wang Laboratories, Inc.** Exiting hardware market but trying to keep its installed base for as long as possible. Wang needs to milk service revenue to subsidize rebirth as a vendor of imaging and work-flow software. Effort could be stifled, even if installed base stays loyal.

Digital. The Buzzin' Robbins Unix strategy has so far failed to impress. **The Design Group:** It sounded good two years ago, but repeated promises of client/server financial gains to come "boor" sound like a broken record now.

Intensive care

For the industry's troubled giants, survival tops the 1994-to-do list

BY CRAIG STEDMAN

FOR DECLINING REVENUE and evaporating profit margins have delivered a stunning one-two punch to many major vendors. Can they fight their way back? Here's the score to date:

IBM
After losing \$4.97 billion in 1992 and \$8 billion plus in the first nine months of 1993, IBM is given a lot of breaking even or reporting a small fourth-quarter profit. But David Wu at S. G. Wurburg & Co. in New York, notes that IBM is heading back to profitability through cost-cutting, even though revenue fell compared with 1992.

"Now they have to raise revenue, and we haven't seen any sign of that yet," Wu says, although he adds that one bright spot is the recovery of the IBM PC Co. That unit turned in a 50% sales increase in the third quarter after getting more aggressive on product cycles and pricing.

However, mainframes still hold the key for IBM, providing about

one-third of its business. "As mainframe revenues and profits go, so does IBM," says Bob Djurdjevic, president of Annex Research in Phoenix.

DIGITAL EQUIPMENT CORP.
Digital's make-or-break Alpha AXP technology faces many major obstacles in steering the company back to growth.

"Their biggest problem is the perception that they're not a real Unix vendor," says Chris Christiansen, an analyst at International Data Corp. (IDC) in Framingham, Mass.

Despite some signs of Alpha growth, Digital still loses orders that should be "open-and-shut deals" due to shortcomings in sales and marketing, notes Wes Mellinger, an analyst at Gartner Group, Inc. Digital admits its sales force has been reluctant to embrace Unix, a problem it's working on.

UNISYS CORP.
While Unisys has had eight straight profitable quarters, its revenue dropped to \$3.6 billion in the first three quarters of 1993, off

by nearly a half-billion dollars from a year earlier. The company has done "a marvelous job" of cost-cutting, "but if the revenue continues to shrink, the profitable footings will go away," says Barry Bosak, an analyst at Smith Barney Shearson, Inc. in New York.

Despite increased U.S. commercial business, Bosak says he sees "no reason" to expect renewed revenue growth in the near term.

APPLE COMPUTER, INC.
Apple has just barely avoided red ink, although its revenue is still climbing. The company is trying to make its cost structure more realistic but is counting mainly on PowerPC-based hardware, due out in early 1994, to turn things around.

The transition "is a make-or-break issue for them," says Peter Hartsook, publisher of "The Hartsook Letter," an Apple-specific newsletter in Alameda, Calif.

Eric Lewis, an IDC analyst, says he expects PowerPC models to account for 15% of Macintosh shipments in 1994 and about half of Apple's volume by 1995. *

Hardware and software leaders

TODAY

HARDWARE

Hardware ratings are ranked by the vendor's total hardware sales including mainframes, minis, PCs, workstations and peripherals

- | | |
|--------------------|----------------|
| 1. IBM | 11. Dell |
| 2. Fujitsu | 12. Packard |
| 3. NEC | 13. HP |
| 4. Hitachi | 14. Digital |
| 5. Hewlett-Packard | 15. Sun |
| 6. Apple | 16. Microsoft |
| 7. Digital | 17. Siemens |
| 8. Siemens Nixdorf | 18. Group Bull |
| 9. Compaq | 19. Samsung |
| 10. AT&T | |

SOFTWARE

Software ratings are ranked by the vendor's total software sales

- | | |
|--------------------|---------------|
| 1. IBM | 11. Dell |
| 2. Microsoft | 12. Packard |
| 3. Fujitsu | 13. HP |
| 4. Digital | 14. CA |
| 5. NEC | 15. Unisys |
| 6. Hitachi | 16. NEC |
| 7. CA | 17. Siemens |
| 8. Siemens Nixdorf | 18. Microsoft |
| 9. Novell | 19. Microsoft |
| 10. Lotus | 20. Microsoft |

Sources: Gartner, Vantage, Standard, Cove, International Data Corp., Framingham, Mass., vendor reports.

VENDORS GET FOCUSED

Back to basics

Cash-strapped vendors are focusing on doing what they do best

BY CRAIG STEDMAN

BRIDGPORT HYDRAULIC CO., A PRIVATE-SECTOR water utility in Bridgeport, Conn., had a demonstration of Digital Equipment Corp.'s DECmcc network management software on Friday last August. The next Monday, word came down that Digital was ditching DECmcc in favor of IBM's NetView/3000.

Although Digital has said it will provide a migration path from DECmcc, Dave Yakerson, Bridgeport Hydraulic's network administrator, says he is glad to have dodged a bullet. "I'd hate to be one of the people that bought into this and got stuck," he says. "But that's just the nature of the beast."

These days, anyway. With profit margins across the computer industry heading south,

vendors are increasingly shedding product lines that don't have a lot of strategic value.

"We're going into an era of unbelievable vendor churn," says Wes Mellinger, an analyst at Gartner Group, Inc. in Stamford, Conn.

"There's going to be a lot of orphan hardware out there and maybe even orphan database managers."

Some customers are worrying more about getting stuck with the unwanted offspring. "It makes you nervous when [vendors] start narrowing the focus because, as a user, I'm not narrowing things," says Tim Bird, director of information services at Paws, Inc. in Munich, Ind.

Bird tries to lower the risk of getting caught on the hardware side by leasing his equipment. "We might get burned, but we won't get burned for more than three years," he says. Other users are looking for portable software as a hedge against obsolescence.

"It's probably scarier now because of all the volatility in the industry," adds Raymond Sasso, chief information officer at J. R. Simplot Co., a food processor in Boise, Idaho. "Recent events show there are no safe harbors."

J. R. Simplot is finishing implementation of a distributed warehouse inventory system based on Digital's DECsystem hardware and Ultrix operating system, both of which are being de-emphasized.

The system works fine, but the platform "doesn't have a future as far as I can tell," Sasso says. "We see it as a fairly common experience in the future." *

OVER AND OUT

THESE PRODUCTS HAVE BEEN DROPPED OR ARE BEING PHASED OUT BY VENDORS AS THEY FOCUS ON MORE STRATEGIC PURSUITS

- | | |
|--|---|
| IBM
Observation LAN | Control Data
Systems, Inc.
Cyber mainframes |
| Digital Equipment Corp.
DECsystem/3000 hardware lines | 3Com Corp.
3+ Share LAN software |
| Sun Microsystems, Inc.
OpenLink user interface | Borland
International, Inc.
Multiplatform word processors |
| Lotus
Development Corp.
Brief programming tools | Wang
Laboratories, Inc.
Personal computers |
| Next Computing, Inc.
Next workstation hardware | Alliant Computer
Systems Corp.
FX series minisupercomputers |
| Unisys Corp.
V series mainframes | |

BOOM!

That's the sound of firms falling over themselves to get in on the convergence of computing and communications

BY JAMES DALY AND
MICHAEL FITZGERALD

FIFTY-SEVEN CHANNELS AND NOTHING ON? Try double that. Try thinking about television replacing the telephone. Or the possibility of a vast sensory garden of educational and entertainment options.

Take your pick. But brace yourself. The forthcoming "digital convergence"—the blending of the computer, publishing, entertainment, cable TV and consumer electronics industries in one TV-top device—promises to generate dozens, perhaps hundreds, of mergers and alliances. For the next two years, the tantalizing promise of merging high technology with a long-established common denominator market means a frenzy of partnerships, mergers and buyouts, many of which will be less than harmonious.

Oh, and by the way, here's the hype: Jonathan Crane, president of national accounts at MCI Telecommunications Corp., calls the computer and telecommunications industries "the twin engines that are helping to re-engineer the way the world works today."

The realm of information systems may reap



EMERGENCY

In a year of mega mergers, four stood out as leading indicators of industry consolidation

ACQUISITOR	ACQUIRED	PRICE
AT&T*	McGraw-Hill	\$12 billion**

This megadeal could make wireless services a reality sooner than expected, providing the Securities and Exchange Commission decides the partnership does not violate antitrust and tariff regulations.

Bell Atlantic	Tele-Communications, Inc.	More than \$12 billion**
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The biggest merger in U.S. history could further this partnership, announced in October, and other huge communications deals have forced the FCC's hand in regulating once-distinct industries.

Cisco	Crescendo	\$90 million
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About 50 major hub and router makers will regroup into roughly 10 large players during the next few years, according to Broadview Associates.

Starling Software, Inc.	Systems Center	\$196 million
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The deal consolidates mainframe systems management tools under the Starling roof.

*Pending **Estimated

its biggest spending boom—and garner its highest headshots—in recent times. Companies agree at the chance to market directly into customers' homes will need new systems designed—systems capable of gauging new markets, selecting the best targets, getting to them and taking in huge amounts of information on the backswing and processing it in real time.

SOMETHING NEEDS TO CHANGE

"It's absolutely an IS challenge," says Douglas Murphy, director of IS at Comcast Corp., a major cable provider that has its teeth in several of the new digital pies.

Murphy says digital convergence definitely means a different mind-set for IS. "I'm not to supporting the [administrative side], and now you're talking about IS out there at the field level. Our billing vendors are scrambling to come up to speed on how to track every single transaction and event."

Combining "the power of the PC with the simplicity of the TV," as General Instrument Corp. Chief Executive Officer Donald Hunsfeld puts it, means changes for IS outside "cable land" as well. It grabs the minds of retailers and bankers, among others.

Allen Courtyer, senior vice president and manager of the data division at Texas Commerce Bank, says bringing banking services into homes via TV is "a tremendous opportunity for us."

"It's a very interesting series of mergers; the mind goes wild with all the options," Courtyer says.

He points to the opportunity to let people call up bank statements on their TVs as something that could reduce back-office costs for the bank and enhance customer service.

Justin Alexander, manager of advanced technology at SmithKline Beecham, Inc. in Philadelphia, says he sees plenty of potential for internal improvements as well. "We think of it as... being able to use telecom and computers to pull the company closer together. That's an extremely powerful thing."

NOT EVERYONE'S EXCITED

Still, some IS managers, even at telecommunications companies, are skeptical of the ventures. For instance, John Miller, director of office systems technology at GTE Corp.'s GTE Telephone Operations, says that even though his company is already equipped with an internal integrated Services Digital Network backbone and makes some in-house use of desktop-to-desktop videoconferencing, all this hoopla about convergence has very little to do with his current plans.

"I just don't see it in the short term affecting my plans internally at all," Miller says, dismissing the visions of de-everything, be-everything technology as simply not close enough to reality.

Technology, though, is not the main issue. The big stumbling block for IS, as well as for everyone else, will be cost, starting with cost to the customer everyone is hoping to reach. Right now, it appears to be a much bigger number than consumers will be willing to absorb. "There is a very receptive audience for interactive products in the home, but execution and pricing will be key for product success," says Bruce Ryon, principal analyst at Dataquest, Inc.'s multimedia service.

Consumer research suggests that when given the ability to choose from a broad range of programming, the majority of viewers will not watch TV advertising. Without advertising revenue, however, the cost of interactive TV could be prohibitive.

Another cost factor is that poor quality wiring in the home may need to be replaced, especially to handle video-on-demand. The Yankee Group estimates that the per-house cost could reach as high as \$1,000.

Courtyer calls cost the big question. "Think of what they have to pay to lay the cable to get this ready; somebody's going to have to cut that cost. This thing is sort of like a hillbroad, and it comes down to who owns it and what does it cost [for us] to put things there?" he says. ■

The fast-track favorites

The Microsoft of tomorrow may be in a garage today. Or it may be a fat investor's darling with \$35 million of venture capital. It's impossible to guess who will be the next big winners in this rollicking industry, but here is our list of a few little-known companies that we believe have a shot at making big names for themselves.



NICHE:
Work-flow software

PRESIDENT:
Thomas E. White

Noted by its solid record as an innovator in the area of electronic mail (the company developed MHS, or Message Handling Service, a messaging infrastructure now in use in Novell, Inc. NetWare LANs), Action has turned its attention to work flow, which some say will be the next killer application.



WHITE

The Alameda, Calif., company, which is venture capital-backed, has built its system around two approaches that fit into the way many PC users work. One uses Lotus Notes as a framework but supplies front-end, work-flow design and routing mechanisms. The other piggybacks on the existing SQL relational database at the customer site.

Customers include Bankers Trust, Electronic Data Systems Corp. and General Motors Europe.



NICHE:
Image scanning and recognition

PRESIDENT AND CEO:
Mikka Kennedy

San Diego-based Excalibur's PixText Electronic Filing System has a free-form—as op-

posed to a keyword- or topic-based—approach to indexing and searching for imaged documents. The system uses an adaptive pattern recognition system that recognizes images based on data in the image. With ASCII text, for instance, the system indexes every letter of every word on every page. It then searches based on discrete patterns in the text. Say you're searching for Kadhafl. Whether you enter Qaddafi or



KENNEDY

Kadhafl, the algorithm will find enough patterns for the system to return all spellings each time data is added to the repository. The pattern recognition part of the system is also sold separately as a tool kit for companies to create their own applications. It's popular for security applications in which employee images are matched to previously archived photos. Companies such as IBM, Digital Equipment Corp., Hewlett-Packard Co. and Sun Microsystems, Inc. refer customers to Excalibur when they need a system like this.



Case Technology, Inc.

NICHE:
Computer-aided software engineering (CASE)

CEO:
Gene Bedell

This 3-year-old spin-off of First Boston Co. has been a juggernaut, ramping up to more than \$34 million in revenue with its object-oriented CASE tool set.

According to Gartner Group, Inc. in Stamford, Conn., Bedell's strengths in the integrated CASE client/server development tools market include support for a large number of client/server platforms, an event-driven graphical user interface and a version-rich repository.

The Cary, N.C., company has already fashioned a niche with financial services firms such as Charles Schwab & Co. and



BEDELL

Palm/Webber, Inc.



NICHE:
Database queries
PRESIDENT AND CEO:
Won Kim

Won Kim's firm appears to have one of the few systems available that can store and retrieve object data types as objects, using the SQL data access language.

Kim's Austin, Texas-based company has apparently succeeded where others have merely tried. Oracle Corp. has yet to announce a similar capability. HP has backed away from this type of functionality, even though it is heavily invested in an object-oriented future.

Some of UNISQ's customers include Hughes Aircraft, AT&T, the U.S. Air Force and Goldman, Sachs & Co.



KIM



NICHE:
Microprocessors
CEO:
Alfred J. Stein

A partnership with Microsoft Corp., Compaq Computer Corp. and Intel Corp. to build integrated 386 processors for handheld devices has Santa Clara, Calif.-based VLSI in the catbird's seat. VLSI specializes in space-efficient "glue-logic" chips, which build in many other processors needed to drive PCs. In fact, VLSI developed the chip set used in Apple Computer, Inc.'s Newton.

Intel previously licensed its x86 architecture to VLSI, in which it currently has a 10% stake. When the deal was inked to develop personal digital assistant (PDA) chips, the two brought in Microsoft to support the Palm chip set, as it's called, with AT&T. That way users can access their At Work desktop-based documents via a PDA



STEIN



1. A high-tech executive recently wrote a book that has nothing to do with computers. It's about diet and nutrition and is titled *The Ten Percent Solution*. Is the author *Mikhail Kapur*, *Ray Karmell*, *Phillips Kahn* or *John Abern*?

2. What software program holds the dubious distinction of being set to expire on the 100th anniversary of the longest time—four years and two months? *Virus R 1-3-3* for the Macintosh, Windows, *Illness IV* or *Q&A*?

3. According to the investment monthly "The Red Herring," a newly minted CEO laid off an executive VP and board member with the words "I'm having to cut the fat around here, and you're the fat." Who was the CEO?

4. How many Microsoft's employees own at least a million dollars' worth of company stock?

5. Scott Page, one of the co-founders of *7th Level*, Inc., which sells interactive multimedia entertainment software, played tennis for which rank group? *Chapman*, *Pink Floyd* or *Yes*?

6. What NSA team does *Internal Researcher's Paul Allen* own?

7. What is the annual cost of generating the power to run all the PCs in the world: \$1.2 billion, \$4.8 billion or \$7.1 billion?

8. Name the high-tech company that raised the most venture capital in the first three quarters of 1993.

1. Ray Karmell
2. 1-3-3 for the Macintosh
3. Michael Gendler, CEO of Apple, laying off Albert Einstein
4. 2,000
5. Pro
6. The Portland Trail Blazers
7. \$4.8 billion
8. Openvision Technologies in Pleasanton, Calif., raised \$35 million from one company, Newberg Prime Ventures

Sources: The Computer Museum, Boston; The Level, Inc.; The Green PC (Microsoft, Alden-Hill); "The Red Herring" (Penguin Communications, Inc.); Redwood City, Calif.

FORECAST '94: An Industry Restructures

FAVORITES

Continued from page 35

containing the Polar chip set.

Meanwhile, Compaq has chosen the Polar chip set for its PDAs, expected in 1994. Other PDA manufacturers are also expected to use the Polar chip set.

With the handheld market projected to boom in the next few years, VLSI could be in the right place at the right time.

Platinum Software Corp.

NICHE:
Financial
software

CEO:
Gerald R.
Blackie



The client/server financial market is so competitive that it is unclear who will emerge as the market leader. Platinum may come out on top because of its mature reseller channels and strategy of finding good software and then acquiring the maker.

In November, for example, Platinum acquired Lotzof Associates and its client/server cost management system.

"When Platinum sees a better technology, they buy it," explains Ted Mountzaris, director of application development at General Cinema, Inc. in Chestnut Hill, Mass.

So far, the company has announced major strategic business partnerships with Sun, Digital and HP and reported an annual earnings growth of 147% for fiscal year 1993. Its 1993 revenue was \$39 million.

SystemSoft Corp.

NICHE:
Mobile computing

PRESIDENT AND CEO:
Robert
Angelo



This Natick, Mass., venture capital-backed firm has a serious leg up in the PCMCIA market. It has already made a name for itself with its Cardsoft prod-

uct, which enables PCMCIA cards to be compatible with any notebook. More recently, it signed a deal with Microsoft to allow Chicago to offer built-in PCMCIA compatibility.

With 50% to 60% growth each year since 1989 and \$10 million projected revenue for the end of the fiscal year (January 1994), SystemSoft shows promise.

Nattek, Inc.

NICHE:
Network management

CEO:
Andre Schwager

This company is reputed to have the only truly distributed network management product on the market today. McDonald's Corp. and other large companies are considering Dinamus, or Distributed Management of Networks and Systems, for their sites. The Los Altos, Calif., company is rumored to be supplying its technology to Sun for its upcoming distributed SunNet Manager. Netlabs is also supplying technology to AT&T/NCR as

the basis for its enterprise network management platform.

Syzgy Communications, Inc.

NICHE:
Internetworking

CTO:
Steven J. Jackowski

Although very small, this Scotts Valley, Calif., company will have a big impact on people with large bandwidth needs.



Syzgy is working on ways for router companies to reserve bandwidth so video and other real-time services can be delivered over an internetwork backbone.

Without the guaranteed bandwidth, you can deliver video only over leased lines.

Syzgy is also said to be negotiating with some very key industry players.

OpenVision Technologies

NICHE:
Systems management
software

CHAIRMAN AND CEO:
Mike Fields

This venture capital company's investors think there is money to be made in creating a suite of Unix utilities. They may be right. Computer Associates International, Inc. is trying to do the same thing.

Founded by Mike Fields, former head of Oracle USA, Pleasanton, Calif.-based



OpenVision is going the acquisition route. OpenVision Technologies has purchased 11 companies, including a former Digital market utilities company, to pull together a set of utilities and convert them to Unix.

In the commercial arena, Unix needs a full suite of system utilities to make it a production-level system. *

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CALENDAR 1994

So many trade shows, so little time to spare.

JANUARY 5-6:
MacsWorld
San Francisco, (617) 361-2001

JANUARY 24-27:
ComNet
Washington, (808) 879-6700

FEBRUARY 15-17:
Networks Expo
Boston, (201) 346-1400

MARCH 21-22:
UniForum
San Francisco, (800) 225-4886

APRIL 19-21:
Networks Expo
San Francisco, (201) 346-1400

MAY 2-4:
Interop/Networld
Las Vegas, (415) 941-3399

MAY 16-17:
MacWorld
Washington, (617) 361-2001

MAY 23-25:
Windows World/Comdex/Spring '94
Atlanta, (617) 449-0600

MAY 24-27:
DS Expo
San Francisco, (800) 208-EXPO

JUNE 28-30:
PC Expo
New York, (201) 346-1400

JULY 27-29:
Object World
San Francisco, (808) 879-6700

AUGUST 2-8:
MacWorld

Boston, (617) 361-2001

SEPTEMBER 12-14:
Interop/Networld
Atlanta, (415) 941-3399

SEPTEMBER 20-22:
Networks Expo
Dallas, (201) 346-1400

OCTOBER 4-6:
Unix Expo
New York, (201) 346-1400

OCTOBER 18-21:
PC Expo
Chicago, (201) 346-1400

NOVEMBER 14-19:
Comdex/Fall '94
Las Vegas, (617) 449-0600

JANUARY 19-21:
Client/Server Conference & Exposition
San Jose, Calif., (516) 562-7460

FEBRUARY 7-9:
Meta Group's Metamorphosis 1994
Coronado, Calif.,

(203) 225-6362

FEBRUARY 14-15:
Gartner Group's Migration Strategies Conference
Orlando, Fla., (203) 967-6757

FEBRUARY 14-17:
Mobile World
Dallas, (201) 309-8404

FEBRUARY 22-MARCH 2:
Groupware '94
Boston, (802) 861-1280

MARCH 7-10:
Mobile '94
Sponsored by Technologic Partners, San Jose, Calif., (212) 696-9330

MARCH 8-11:
Gartner Group's Personal Computing Conference
New Orleans, (203) 967-6757

MARCH 9-11:
Software World
Toronto, (808) 470-3880

MARCH 13-17:
Help Desk Institute's 1994 International Conference
Nashville, (719) 531-5138

MARCH 15-17:
International Software Business Development Conference
(Formerly Software Development Conference), San Jose, Calif., (203) 947-6131

MARCH 20-23:
The PC Forum, "Interactivity Is Two-Way"
Sponsored by Edventure Holdings, Phoenix, (212) 924-6800

MARCH 29-31:
Multimedia World
Las Vegas, (410) 626-1380

MARCH 31-22:
Gartner Group's Business & Asset Management Conference
Tucson, Ariz., (203) 967-6757

MARCH 23-25:
Meta Group's Global Networking Strategies
Orlando, Fla., (203) 225-6362

APRIL 5-6:
15th Annual Conference

CALENDAR, page 33

FORECAST '94: An Industry Restructures

Continued from page 37

on IS Performance and Capacity Management
Phoenix, (602) 967-7374

**APRIL 14-15:
Gartner Group's Industry Futures Conference**
Boston, (203) 967-6757

**MAY 4-5:
Gartner Group's Economics of Networking Conference**
Orlando, Fla., (203) 967-6757

**MAY 9-11:
Meta Group's Services and Systems Management Strategies**
Reston, Va., (203) 226-6382

**MAY 23-26:
Gartner Group's Application Development Conference**
San Diego, (203) 967-6757

**JUNE 13-16:
Meta Group's Enterprise Data Center Strategies**
Universal City, Calif., (203) 226-6382

**JUNE 17-18:
Outsource Conference**
Dallas, (806) 470-3880

**JUNE 20-21:
Gartner Group's Client/Server Conference**
Scottsdale, Ariz., (203) 967-6757

CALENDAR

It's funny — a conference in Tahiti is always more valuable.

**JUNE 27-29:
Gartner Group's Next-Generation Applications Conference**
San Antonio, (203) 967-6757

**JUNE 28-30:
Database World**
Sponsored by DCI, Client/Server World, Boston, (806) 470-3880

**JUNE 28-30:
Wireless Datacomm**
San Jose, Calif., (203) 847-5131

**JULY 15-18:
Network Outlook '94**
Sponsored by Technologic Partners, San Francisco, (212) 696-9330

**JULY 31-AUGUST 4:
American Association for Artificial Intelligence's National Conference**
Seattle, (415) 326-3123

**SEPTEMBER 12-14:
Meta Group's Advanced Information Management Strategies**
San Francisco, (203) 226-6382

**SEPTEMBER 26-28:
Meta Group's Application Development Strategies**
Coronado, Calif., (203) 226-6382

**OCTOBER 17-19:
Meta Group's Open Computing and**

Server Strategies
Phoenix, (203) 226-6382

**NOVEMBER 7-9:
Second Pan American EDI Users Conference and Exhibit**
Sponsored by EDI Association, Toronto, (416) 821-7180

**NOVEMBER 16:
Communications Managers Association Telecom '94**
(201) 428-1700

**DECEMBER 5-6:
The Personal Computer Outlook**
Sponsored by Technologic Partners, San Francisco, (212) 696-9330

**DECEMBER 8-9:
Wireless Datacomm**
Washington, (203) 847-5131

**FEBRUARY 1-2:
Conference Board's**

Strategic Management Conference
Los Angeles, (212) 338-0290

**FEBRUARY 3-4:
Executive Technology Summit**
Sponsored by the Society for Information Management and Computerworld, Tarpon Springs, Fla., (800) 864-6473

**FEBRUARY 13:
College of Healthcare Information Management Executives' CIO Forum**
Phoenix, (312) 665-0000

**MARCH 31-32:
Financial Executive Institute's Information Management Issues Conference**
Chicago, (201) 896-4800

**APRIL 9-7:
Conference Board's Business Re-engineering Conference**
New York, (212) 338-0290

**APRIL 13-14:
Conference Board's Management**

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85 Server

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Development Conference
New York, (212) 339-0290

**APRIL 20-23:
SIM Conference**
Ponte Verde, Fla.,
(312) 644-6610

**MAY 8-11:
Association for Systems
Management's Annual
Information Systems
Conference**
Orlando, Fla., (216) 243-5900

**MAY 11-12:
Hammer Forum and Clinic**
Boston, (617) 354-5555

**MAY 13-13:
Conference Board's
Deflating Internal
Customers Conference**
San Diego, (212) 339-0290

**MAY 28-29:
Conference Board's
Information Management
Conference**
New York, (212) 339-0290

**JUNE 21-22:
Conference Board's
Virtual Corporation
Conference**

New York, (212) 339-0290

**AUGUST 17-21:
Black Data Processing
Association's National
Conference**
Cleveland, (800) 727-2372

**SEPTEMBER 18-21:
SIM Conference**
Salt Lake City, (312) 644-6610

**OCTOBER 3-7:
Gartner Group
Symposium '94**
Orlando, Fla., (203) 967-6757

**OCTOBER 31-NOV. 2:
InfoTech '94**
Sponsored by the Data
Processing Management Association,
Louisville, Ky., (708)
825-5124



**FEBRUARY 20-26:
Share 82**
Anaheim, Calif., (312) 822-0932

**MARCH 11:
Guide International Corp.**
San Francisco, (312) 644-6610

**MARCH 13-18:
"Re-Visioning IT:
Achieving an Enterprise
Perspective"**
Sponsored by CIO magazine,
Orlando, Fla., (508) 935-4461

**MARCH 18-19:
Interim Computing Management
Symposium**
New Orleans, (408) 747-0227
(International Association of HP
Computer Users)

**MARCH 21-24:
COMMON Spring '94**
Anaheim, Calif., (312) 644-6610

**APRIL 11-18:
Use, Inc.**
Nashville, (301) 577-1881

**APRIL 24-27:
NCR Users Conference**
Louisville, Ky., (800) CALL NCR

**MAY 7-12:
Digital Equipment Computer Users Society**
New Orleans, (800) 332-8755

**MAY 8-12:
International DB2
Users Group**
San Diego, (312) 644-6610

**MAY 25-28:
International Communications
Association**
Dallas, (214) 233-3689

CALENDAR
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all the parties
at Comdex -
just no way.**

**JUNE 13-17:
INET '94, The Annual
Conference of the Internet
Society**
Prague, 31-20-636-1131

**JULY 10-18:
Guide International Corp.**
Atlanta, (312) 644-6610

**AUGUST 7-12:
Share 83**
Boston, (312) 822-0932

**SEPTEMBER 18-22:
Interex Annual
Conference**
Denver, (408) 747-0227

**SEPTEMBER 23-30:
International Oracle
Users Week**
San Francisco, (800) 441-4554

**OCTOBER 3-7:
Telecommunications
Association 1994
Conference and
Exhibition**
San Diego, (609) 945-1122

**OCTOBER 18-20:
COMMON Fall '94**
San Antonio, (312) 644-6610

**OCTOBER 23-29:
IT Economics: Business
Value and Profit
Maximization**
Sponsored by CIO magazine,
Tucson, Ariz., (508) 935-4461

**NOVEMBER 8-11:
Guide International Corp.**
Atlanta, (312) 644-6610

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All that glitters ...

OPINION BY FRANK GENS

IN 1984, CLIENT/SERVER technologies will begin to take on enterprise-scale applications, and IS organizations will face the urgent challenge of picking products and suppliers that can stay the course.

Making such a call requires more than simply looking at a list of today's client/server leaders. The history of information technology is full of highfliers that quickly crashed to earth. The best bet is to look for suppliers that fulfill the seven simple requirements outlined below.

1. Understand who the new competitor is.

Enterprise client/server systems are forcing a convergence of vendors, technologies and cultures from the desktop to the data center. This means competitors will increasingly come from outside suppliers' traditional markets. Vendors that don't understand this will be blindsided.

2. Actively participate in the desktop market.

Why? Because that's where the money is—almost two-thirds of hardware revenues in 1983, to be exact. Vendors that snubbed at the desktop will have the most money to invest in new technology and products. Because of this, it is as much more vital for large and mid-range suppliers to scale down than for desktop suppliers to scale up.

3. Aggressively exploit desktop technologies.

Today's most important technologies are emerging from the heavily faded desktop world. This means that even suppliers of data center products are wise to build products using the best of the shelf technologies in the marketplace, and these are most often found on the desktop.

4. Banish "not invented here" thinking.

Ten years ago it was a great vice-

ture to be "vertically integrated." Today, such a strategy is viewed as plain idiotic. It leaves the vendor in an impossible "going-it-alone" position. Yet many suppliers continue to view partnering as a sign of weakness.

5. Recognize that standards are essential for success.

Many consider open systems a user movement aimed at liberating customers. But open standards are actually more vital for suppliers that must increasingly integrate many partners' technologies. Adherence to standards represents the fastest, most cost-effective way to do so.

6. Demonstrate continuity of strategy.

Many suppliers have rushed tactical client/server products to market, giving little thought to how, or if, they fit with existing products and direction. And often, they've given little thought to the future of these products. This knee-jerk approach obviously carries significant risk.

7. Understand IS management disciplines.

Availability and manageability are basic requirements for major business applications—and qualities that many first-generation client/server products lack. They are, however, attributes that data center products generally deliver. Successful suppliers will incorporate the management lessons of the data center into their enterprise client/server products.

Those who play this new game by the new rules will be the ones to bet on as client/server goes enterprise-wide. Right now, many corporations wouldn't pass that test, including some of the hottest client/server vendors. ■

FRANK GENS is vice president of Technology Investment Strategies Corp., a market research firm in Framingham, Mass.



STREET PERFORMERS

Computer industry stocks put on a dazzling show last year with networking and media issues at center stage

ONCE AGAIN, THOSE WILD AND CRAZY computer stocks saved Wall Street from a year of tedium.

Initial public offerings such as **POWERPCORP.** and **NETTRANS-AGE, INC.** provoked feeding frenzies unmatched by anything short of Boston Chicken. **IBM** posted a quarterly loss in the billions, and its share price responded by going up.

KENDALL SQUARE RESEARCH CORP. started at 16, zigzagged to 14, then 25, then plummeted to less than 6. Even among the cheeriest sectors, such as internetworking stocks, things were rarely steady. Four times in the year, **CABLETRON SYSTEMS, INC.'s** stock gained 10 points in a single week. Five times the stock dropped at least 3 points in a week.

For those who are keeping score, we've pulled together a list of 1993's big winners and losers.

And who will be the winners in 1994? We asked three top-notch equities analysts to give their best shot at predicting the coming year. (Unfortunately, we were unable to establish telephonic contact with Jeanne Dixon by press time.)

— BY DIANE BLATT

• **Sequent Computer Systems, Inc.** Selling into the Fortune 200 with turn-key approach.

• **Buss Microsystems, Inc.** New products, lots of post-up demand.

• **Ross Systems, Inc.** Client/server software sales growing about 80% a year.

• **Informix Corp.** Low price/warnings multiple among DBMS vendors. Online 6.0 shipping soon.

• **Progress Software, Inc.** An overlooked company, good upside potential.

• **Manugistics Group, Inc.** Strong applications company.

• **Xircom, Inc.** New wireless adapters.

• **ByteOptics Communications, Inc.** Short-term concerns will be resolved.

• **Cisco Systems, Inc.** Will continue to expand its product offerings and geographic reach.

• **3Com Corp.** Moving into high gear with hubs and routers.

NO PAIN: THE TOP 10 PERCENTAGE GAINERS IN 1993

MICROBANK INC. *366*	BGS COMMUNICATIONS CORP. *170*	BOLT DESIGN & MANUFACTURING INC. *168*	CENTIGRAM COMMUNICATIONS *167*	UNITEL DEVELOPMENT CORP. *164*
EMI CORP. *161*	NEUROBIO ALTERNATIVES CORP. *155*	ORACLE CORP. *151*	PERCON TECHNOLOGIES *149*	CONUL CORP. *149*

NO GAIN: THE TOP 10 PERCENTAGE LOSERS IN 1993

PERCON TECHNOLOGIES -71	UNITEL DEVELOPMENT CORP. -70	ORACLE CORP. -70	PERCON TECHNOLOGIES -70	CONUL CORP. -69
PERCON TECHNOLOGIES -69	UNITEL DEVELOPMENT CORP. -63	ORACLE CORP. -60	PERCON TECHNOLOGIES -59	CONUL CORP. -59

Source: Hooley International, Lafayette, Calif.

Recreating the Mainframe

YOUR MAINFRAME ISN'T DEAD, BUT IT'S SURE looking a lot different. The wide-area network is replacing the backplane; the workstation is supplanting the terminal. Corporate information systems is remaking the functions and features of the mainframe in the form of the company network, only without all the nice controls and management features. The tools are on the way, but for now, reinventing the mainframe is a nail-biting experience. The future will see a multiplatform, multivendor conglomeration of machines and software, each good at doing a few things well. All IS has to do is make it work.

carefully and laboriously crafted by in-house developers.

Yellin explains that any individual component—such as Unix, a database management system or a teleprocessing monitor—may appear to have every necessary feature, but when they are combined, unexpected “dysfunctions” emerge. As a result, Yellin estimates that users will not get the 99.99% uptime available from mainframe systems in their client/server networks with off-the-shelf software for four to five years.

JUST KEEPS GETTING BETTER

This year, Yellin predicts, users will see further emergency and improvement of standard network management systems such as Hewlett-Packard Co.'s OpenView, IBM's RMC/3000 and Sun Microsystems, Inc.'s SunNetManager. He also says users should watch for the rollout of more products using “middle-ware” (which

IN THIS SECTION



The real costs of client/server are about as tough to figure out as the payback.
PAGE 41



SNA is finally poised to become a good citizen in the internetworked world.
PAGE 42

CW SURVEY

47%
of users surveyed have experimented with

client/server, but that number won't rise as

PAGE 43

CLIENT SERVER TOOLS

Don't bet the store just yet

Distributed management tools approach the mainframe in capability

BY GARY H. ANTHERS

THE CLIENT/SERVER INFRASTRUCTURE MAY NOT be quite ready to support mission-critical applications, but significant improvements in tools for distributed computing will be made in the coming year.

Jerrald M. Grochow, chief technology officer at American Management Systems, Inc. in Arlington, Va., says products for testing and soft-

ware distribution are especially weak, but he predicts substantial improvements in the next year or two.

However, Robert Yellin, chief technology officer at Legent Corp., a systems management software vendor in Herndon, Va., is slightly more conservative. Yellin points to gaps in systems management software and notes that industrial-strength Unix applications running in industries such as finance and insurance are

provides common services across multiple platforms and hides ugly interfaces from users) based on technology from organizations such as the Open Software Foundation and PeerLogic, Inc. in San Francisco.

Some users dispute the contention that it is unsafe to move out of the glass house. They

TURNER'S JOHN GOOD:

For client/server success, users should trust the network as if it were the glass house



“CLIENT/SERVER OUGHT TO COME WITH A LABEL SAYING: ‘MISUSE OF THIS COULD BE HARMFUL TO YOUR HEALTH.’”

JAMES DALY
DIRECTOR OF HUMAN RESOURCES ADMINISTRATION
NEW ENGLAND TELEPHONE CO.

GET YOUR APPS TOGETHER EMERGING PRODUCTS CAN GIVE OLD SYSTEMS THAT CLIENT/SERVER FEEL

point with pride to LAN servers where mainframes once stood.

Several years ago, for example, DynCorp in Reston, Va., moved everything off its small mainframes and never looked back. Butch Fernstrom, MIS director at DynCorp, says features such as backup, recovery and security are available in the LAN environment. DynCorp fitted each file server with redundant disk arrays and controllers and beefed up one desktop machine to act as a substitute server if the main server went down.

TRYING OUT CLIENT/SERVER

Like DynCorp, the city of San Antonio found that by using redundant components it could move mission-critical applications—in this case, its 911 emergency dispatch system—to client/server. In making the move from an Amdek Corp. 3600-700 mainframe to a LAN built around NCR Corp. servers and PCs, the city bought extra protection in the form of NCR's LifeKeeper, which links redundant computers for fault tolerance.

"We've built a lot of redundancy into the server. We have the disks covered and the CPUs covered," says Frank Stromboe, director of information services for the city. The network is the weak link—the most likely to fail, he adds.

Users who have gone all the way to distributed systems say it is important not to get too fancy. For example, when Turner Corp. in New York moved everything to client/server in the late 1980s, it elected not to set up local subsets of the human resources databases at remote sites because of potential problems keeping the databases synchronized.

Turner now has several thousand users on 60 LANs across the U.S., and the New York-based mainframe is fading from memory. John Good, director of information technology and systems support, says Turner has ensured reliability by choosing excellent technical people, buying from vendors with good track records and treating LAN gear with the same care traditionally given to equipment in the glass house.

"Just because it's on a PC doesn't mean we can show that into a hot closet and forget about it," Turner says.

DEVELOPING AN OBSTACLE

Some say the hardest thing about client/server is designing and developing the applications, not running them. David MacSwain, marketing vice president at Software AG of North America, Inc. in Reston, Va., says there are a couple of reasons for this. One is the difficulty in choosing which of several distributed computing models makes the most sense for each application. Another is that no vendor has yet overcome the difficulty of managing large software development projects in distributed environments.

Software AG hopes to eventually offer tools that will address both issues, but doesn't look for them soon. There are plans for automated tools to evaluate different computing models and their various trade-offs, but those won't hit the market for 18 to 36 months.

And as for software development management solutions, those are at least two years—and possibly three years—away.

THE MOST EXPENSIVE ASPECT OF DOWNWARD ISN'T THE cost of the equipment but the job of integrating existing applications with the new ones built to run PC servers. Short of taking the most expensive route and actually rewriting entire applications, IS managers have three basic strategies at their disposal:



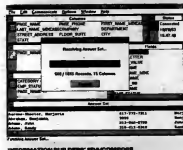
SAS/STAT DATA SET

1. Screen scraping

The easiest approach is simply to give existing applications a face-lift by redesigning the user interface with frontware tools such as those from Eazel Corp. in Burlington, Mass., Mozart Systems Corp. in Burlingame, Calif., and Intelligent Environments, Inc. in Tewksbury, Mass.

Generally referred to as screen scrapers, these tools essentially expand upon terminal emulation to give users a tool for querying and downloading data from a mainframe to a PC application running a graphical user interface.

While this method does nothing to reduce mainframe investment, it at least provides a quick way to give users a graphical front end to a well-entrusted application.



INFORMATION BUILDERS' REACOMPARE

2. Placing calls from the gateway

A second tactic that information systems managers can take is to plug PC-based client/server applications into SQL gateways that are capable of calling data from both

relational databases and flat-file systems. Just about all the major database vendors offer SQL gateways, including Oracle Corp., Information Builders, Inc., Sybase, Inc. and The ASK Group, Inc.'s Ingres Products Division.

This approach allows IS managers to support a large number of users by deploying a few dedicated servers to run the gateway software. This reduces the mainframe from having to process each SQL individually.

Chevron Corp. in San Francisco chose this option when it decided to revitalize an IBM IMS accounting application for about 75 users. Instead of completely rewriting the application, Chevron augmented the batch-oriented portion running in IMS with a subsystem written in PowerBuilder from Powersoft Corp. in Burlington, Mass., that accesses DB2 as a front end to the IMS system. A SQL gateway from Oracle provides the connection between the DB2 and IMS systems.

According to Donald Weisman, a Chevron staff specialist, the benefit of this approach is that it still keeps the primary logic for the application on a mainframe but allows Chevron to give its users PC tools.



TEXAS INSTRUMENTS' COMSO

3. Automated reconstruction

If it isn't installing the mainframe is an all-consuming passion for some companies, a number of vendors offer high-level tool sets that are capable of analyzing the logic in an application and re-engineering it for client/server deployment. They include Viasoft, Inc., Texas Instruments, Inc., KnowledgeWare, Inc. and Netron, Inc.

Based largely on technology created for computer-aided software engineering (CASE) products, these tools typically have the ability to ascertain which parts of the application no longer have an appropriate function. This helps keep downsizers from replicating some of the outdated or faulty logic that has crept into the mainframe application over the years.

On the downside, these tools typically require IS shops to hire consultants who are conversant in the CASE languages on which the tools are based. Such projects typically involve a long deployment cycle during which the applications on the mainframe have to be run alongside the new client/server application.

For many IS shops, re-engineering a mainframe application doesn't make a lot of fiscal sense, especially if that application is at the end of its useful life cycle.

— BY MICHAEL VERNER

Cost confusion

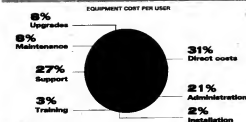
WHEN YOU'RE TOLD THAT YOU WILL SAVE COSTS FOR YEARS BY BUYING ONE, 10, 50 OR 100 PER YEAR, THEN YOU KNOW IT.

	FIVE-YEAR TOTAL
Hardware	2,654
Server hardware	285
Shared peripherals	164
Network equipment	445
Client software	1,588
Server software	117
Internetworking	58
DIRECT COSTS	\$5,309

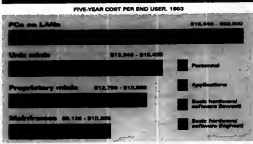
Installation	285
Administration	3,600
Training	529
Support	4,887
Maintenance	1,487
Software upgrade	938
INDIRECT COSTS	\$11,706
TOTAL COSTS	\$17,015

SOURCE: META GROUP INC., WESTPORT, CONN.

BUT DIDN'T THAT EQUIPMENT ACCOUNTS FOR LESS THAN ONE-THIRD OF THE TOTAL COST?



SOURCE: META GROUP INC., WESTPORT, CONN.



SOURCE: XEPHON, CHAPEL HILL, N.C.

What's the real cost of client/server? It depends on who you ask.

FIVE-YEAR COST PER END USER, 1988*

PCs on LANS
\$15,000

Unix minis
\$16,000

Proprietary minis
\$14,500

Mainframes
\$10,200

SOURCE: XEPHON, CHAPEL HILL, N.C. *ESTIMATED

MISSING PIECES

USERS SOUND OFF ABOUT WHY DIVERSE CLIENT/SERVER INSTALLATIONS ARE SO DIFFICULT TO MANAGE

EVEN CORPORATIONS that are aggressively moving their mainframe applications down to client/server platforms are doing so with trepidation. What follows is a sampling of paraphrased views from information systems managers on what has to change and emerging products and standards that promise to start addressing some of the gaps within the next year:

CLIENT/SERVER LACKS the maturity of the glass house environment in areas such as data integrity, security and recovery. The ideal would be industrywide standards that save corporations from having to replicate technical staffs

with expertise in each of those particular platforms and have separate test equipment for each, but "that can be very expensive."

WADE BROWN, EXECUTIVE VICE PRESIDENT AND CHIEF INFORMATION OFFICER, WASHINGTON NATIONAL INSURANCE CO., LINCOLNSHIRE, ILL.



A CONSISTENT CORE curriculum is needed for retraining IS managers in developing, implementing and managing client/server environments. This should not vary from vendor to vendor.

DONALD STERNFELD, DIRECTOR OF IS, MORGAN, LEWIS & BOKERUS, PHILADELPHIA



WE NEED products that track software licenses and vendor contracts throughout the company. We also need products for managing "open" client/server installations on a par with what's now available on the mainframe.

GENE FRIEDMAN, VICE PRESIDENT OF APPLIED TECHNOLOGY, THE CHASE MANHATTAN BANK NA, NEW YORK

WHAT'S MISSING are standardized user sign-on protocols and a universal system for managing security across a heterogeneous client/server environment. "Today, you manage things

one by one."

STASH JAROCKI, VICE PRESIDENT, DIRECTOR IN CORPORATE AUDIT, CITIBANK NA, NEW YORK



NOBODY is providing supporting applications that use a mixture of protocols such as Novell, Inc.'s IPX and TCP/IP but don't require you to support multiple protocol stacks on the desktop. A mixed environment must "behave in ways that make your life reasonable as a systems manager."

GEORGE REID, DIRECTOR OF IS, SANFORD C. BERSTEIN & CO., NEW YORK

OBJECT-ORIENTED PROGRAMMING

Handle with care

Corporate IS toys with object orientation, but few people are ready to get serious

BY JOHANNA AMBROSIO

OBJECT-ORIENTED PROGRAMMING tools are definitely on the computer industry's "hot" list for 1994. But early users are finding that going object-oriented isn't a panacea.

End-user packages such as Microsoft Corp.'s Excel and Lotus Development Corp.'s 1-2-3 are moving upscale and meeting many users' needs just fine.

And complicating things, at least for the time being, is the likelihood that nonobject-oriented will continue to underlie corporate-wide database technology at least through the end of the decade.

Hecy Cortina, senior consultant at The Systems Consulting Group, Inc. in Miami, says that 1993 was "the year of the pilot. This year, 1994, will be when a large percentage of companies will be doing actual development."

Long John Silvers, the restaurant chain based in Lexington, Ky., has developed three applica-

tions using Powersoft Corp.'s PowerBuilder, which supports object-oriented features.

Mark Silvers, vice president of information and technology services at Long John Silvers, says sometimes this kind of technology is beyond the scope of the required application. For example, a system that brings together data or applications from many sources makes sense under object-oriented techniques. But for a quick hit end-user application, Lotus 1-2-3 may do the trick.

"It depends on what you're trying to do," Silvers says. "There's no one strategy that fits for every problem."

NOT ALWAYS THE ANSWER

Philip Pasano, managing director at Bankers Trust Co. in New York, agrees. "Object-oriented is not a silver bullet for everything," he says. "You clearly shouldn't use it to build the core of a transaction processing system."

Object tools are most helpful, he



MARK SILVERS OF LONG JOHN SILVERS advises caution in using object-oriented tools. Although the restaurant chain is using the technology, Silvers says 1-2-3 macros may solve most problems better. However, he says, "There's no one strategy that fits for every problem."

says, "when you want to build an institutional-strength application and leverage it across multiple areas and reuse those objects across one or more business areas."

After about 18 months of learning and using object tools, Pasano says Bankers Trust's developers reuse about 75% of the objects they create. "That is where you see the benefit of object technology," Agway, Inc. in Syracuse, N.Y.,

has been reaping the benefits for some time. It implemented a mainframe-based object development system in Cobol back in 1995.

Dave Dischiave, director of systems support said that since the company began using the libraries of internally created objects, programmer productivity has increased by a factor of 10. "We don't write programs anymore, we assemble them—kind of like a little General Motors," he says. ■

Parallel universe: Few ready to live there

BY JOHANNA AMBROSIO

PARALLEL PROCESSORS ARE EVOKING LOTS of interest, but odds are they won't take over the hot slot in most commercial user shops before 1997.

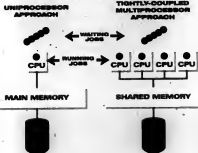
IBM was the most recent entry into the parallel race (ENR Nov. 15), but within the past few years, Kendall Square Research Corp., NCube, Encore Computer Corp., Pyramid Technology Corp., NCR Corp. and others have all introduced machines.

Most of the new crop of high-end machines offer lower costs and higher speeds than the mainframe. Massively parallel processors—those with 100 or more engines—can outperform the mainframe by 100 to 1 or more.

Kansas City Power & Light Co. in Missouri plans to retire its three Unisys 2200 mainframes in late 1996 and is moving all of its applications to Unix boxes, some of them parallel machines. "We're saving 50% a year over the cost of the old mainframes," says Wayne Bogg, director of information technology.

What's the diff

Multiprocessing is one of several new ways to harness the power of many off-the-shelf CPUs



Source: Sun Microsystems, Inc.

But software gaps will hold back the majority of mainframe shops for now. Early users have had to roll their own parallel versions of job schedulers and communications mechanisms between the new and old worlds.

The situation is changing somewhat as systems vendors and the third-party software community have started to address the need for mainframe-like management tools. However, off-the-shelf parallel commercial applications are still rare.

Several database vendors are working with—or already running on—parallel machines. Caddle Corp. and BEZ Systems, Inc. in Deerfield, Ill., provide capacity planning and other tools for the new IBM database query parallel computer, among others.

But the sheer volume of batch jobs, which can run in the thousands each night, is the stopper. No one has successfully broken those up into little pieces to run on individual processors.

"Mainframes have a role in batch for a long time, if not forever," says Richard Winter, an independent consultant in Cambridge, Mass. ■

Progress introduces application developm

Theirs

PROGRESS
SOFTWARE

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ent software with significantly more depth.

Ours

These days, everybody and their brother is offering client/server development software with GUI capabilities. GUI, that is, and not much else. Now, introducing **PROGRESS® Version 7**. The client/server development software with an unprecedented mix of graphical capability and depth. And the only GUI development tools powerful enough to take you from pilot projects to even the toughest mission-critical, client/server applications.

Version 7 also lets you create GUI or character-based applications for client/server, host-terminal or mixed configurations. And the applications

are portable across a wide range of databases, network environments, operating systems and hardware platforms. Plus, your applications are scalable, portable and

reconfigurable without recoding. The result? Increased flexibility to help simplify the move to client/server. And, an investment in applications and systems that stays protected over time. So call the telephone number below to witness **PROGRESS Version 7** in action. At which point, we'll promptly bury the competition. Call 1-800-989-3773 ext. 165 to qualify for a specially-priced Version 7 test drive.



PROGRESS VERSION 7. MISSION-CRITICAL MEETS CLIENT/SERVER.

That SNAke in the grass is finally being charmed

Hard to combine your SNA net with your LANs? Help is around the corner.

BY JOANIE M. WEXLER

WORRIED THAT YOU'LL NEVER find a straightforward way to transfer data across the SNA/LAN divide?

Relax. Next year will deliver the tools for the integration job: standard router-based SNA encapsulation schemes and Advanced Peer-to-Peer Networking (APPN) support, the ramp-up of frame-relay networking and "middleware-like" integration software.

The technologies to finally allow SNA/LAN coexistence as peers will solidify in standard form. These schemes are geared to preserve SNA's class of service in terms of network availability and response time—a key challenge in fitting

SNA onto networks where it now has to share bandwidth with greedy LAN traffic.

The key technologies include Data Link Switching (DLSw), APPN Network Node and IBM's AnyNet software.

DLSw and APPN support on routers will become available from most players, including Wolfteeth Communications, Inc., Clago Systems, Inc., Proteon, Inc. and 3Com Corp. DLSw is a standard way to encapsulate SNA and NetBIOS traffic in packets across now-obliguous TCP/IP backbones. It "fools" source SNA applications into thinking a connection has been made so sessions do not die.

APPN is the "new generation," routable SNA that retains hooks to legacy SNA applications and preserves companies' investments in SNA expertise. Routers will be able to fold native APPN right onto IP backbones with no accompanying encapsulation overhead.

These are key developments for 1994, because IBM's LAN integration is the last internetworking frontier," says Charlie Robbins, director of communications research at Aberdeen Group, a consultancy in Boston.

However, Glenna Brown, a consulting network analyst at Lithonia Lighting in

Traveling companions

The emergence of other protocols on corporate backbones is spurring encapsulation schemes and reducing the amount of native (unprotected) SNA

PERCENTAGE OF BACKBONE TRAFFIC THAT IS NATIVE SNA*

1991: 60%

1992: 62%

1993: 54%

1994: 46%*

1995: 39%*

1996: 31%*

*Does not include encapsulated SNA traffic.

*Estimated.

Source: The Yankee Group, Boston

Coryers, Ga., says he does not have short-term plans to implement the new-fangled schemes because he has more immediate concerns surrounding the mere speed of time-sensitive SNA traffic over wide-area links.

"In 1994, we'll probably be looking at the speed of IGMP2," the next version of Cisco's proprietary routing algorithm, he says. IGMP allows routers to automatically update one another networkwide when a configuration changes.

WHAT ELSE TO DO?

Another solve for SNA's delivery-time sensitivity is maturing frame-relay technology, says Todd Dugres, vice president of data communications research at The Yankee Group, a consultancy in Boston.

Some users may opt for IBM's emerging AnyNet software as their integration foundation. AnyNet is the embodiment of IBM's Networking Blueprint, a master plan for transport-independent networking.

The idea is to allow applications designed for one underlying transport network to run across others. For example, SNA could traverse IP or Novell, Inc. IPX networks and vice versa. *

HOWARD MAYNARD of Young & Rubicam ponders a future when central management of software corporations will be key to

Perimeter control

If you're wrestling with managing a distributed operation, help is finally on the way

BY JOANIE M. WEXLER

CORPORATE INFORMATION systems organizations will spend much of 1994 trying to regain some measure of centralized control over proliferating networks, but they can expect considerable assistance from suppliers.

For example, several vendors are readying products that will help customers plan and optimize expensive wide-area bandwidth: Symplex Communications, Inc. in Ann Arbor, Mich., will introduce a product line that gives remote offices LAN-like performance but eases planning, installation and support.

Ascend Communications, Inc. in San Francisco plans to release a San Francisco management device that can track all applicant lines within a corporation—including voice, LAN and video traffic—and dial up the appropriate bandwidth

on demand.

Remote access vendor Centrium Communications, Inc. in San Jose, Calif., will add accounting and security-oriented network management applications to its existing software.

FEWER PLATFORMS IN '94

The year will also see greater platform consolidation of network management systems, "allowing users to merge the logical LAN with the physical network," says Todd Dugres, vice president of data communications research at consultancy The Yankee Group.

Dugres says mergers such as those between smart hub maker SynOptics Communications, Inc. and Novell, Inc. and between router vendor Cisco Systems, Inc. and Microsoft Corp. will help users manage the network "as an entity rather than as a collection of smaller networks."

Vendors will also provide help

for those struggling to keep software upgrades consistent across the enterprise.

This is a pressing concern for Howard Maynard, director of MIS at global advertising agency Young & Rubicam, who says upgrading a worldwide framework that includes Novell LANs, Notes servers and CC-Mail gateways is "a staggering task."

NetLabs, Inc. in Los Altos, Calif., hopes it can make the job less staggering in 1994, with an automated asset management system that collects depreciation, warranty and other data on remote devices in a central database.

Meanwhile, hubs and routers will converge, combining many communications functions, including resource configuration for virtual workgroups, into centrally managed "superboxes."

Cabletron Systems, Inc., SynOptics and others are currently at work on such devices. *

Mainframe pulse check

rumors regarding the death of the mainframe have been greatly exaggerated. Big iron is alive and well in the vast majority of IS organizations sampled in our annual Forecast survey. Two-thirds of the IS organizations we surveyed have not moved any critical applications off the mainframe. Within two years, half of them will still not shift key systems off these large-scale plat-

EXCLUSIVE CW SURVEY

forms. Sixty percent say that mainframes will be either very critical or somewhat critical to their operations five years from now. For those that have tried client/server, most say these projects cost more than mainframe application development projects. But 29% say that client/server performance is better. Bottom line: While client/server offers some advantages, most shops are not ready to risk key applications on alternative platforms yet.

Biggest Client/Server Stumbling Blocks

ON A SCALE OF 1 TO 10, WHERE 1 IS THE LEAST DIFFICULT AND 10 IS THE MOST DIFFICULT

5.8

**ACHIEVING
ACCEPTABLE
PERFORMANCE**

5.6

**COST-EFFECTIVE
APPLICATION
DEVELOPMENT**

5.4

RELIABILITY

**PROGNOSIS DIVIDED
ON HOW CRITICAL
MAINFRAMES WILL BE
IN FIVE YEARS:**

28%
VERY
CRITICAL

18%
NOT AT ALL
CRITICAL

**SLOW BUT STEADY
MOVEMENT OF KEY
APPLICATIONS TO
SMALLER PLATFORMS:**

27%
1993

44%
1995

**EXPERIMENTING
WITH
CLIENT/SERVER:**

47%
HAVE

55%
HAVE
NOT

PULLING THE LAST BIG PLUG:

LESS THAN

13%

**HAVE
ALREADY
DONE IT**

3.5

**YEARS IS THE
MEAN FOR OTHERS
WHO SAY THEY WILL**

PEOPLE TO WATCH

► **Hadi J. Polynin, Karsten Manufacturing Corp.**

For IS director Polynin, large-scale parallel processing is yesterday's news. In 1989, Polynin decided his company, a Phoenix manufacturer of custom golf clubs, could benefit from parallel processing. So he acquired a Terasdata Corp. 16-processor machine (capable of scaling to more than 1,000 processors) to handle transaction processing. While there were locking and language compatibility problems to work out, the IS group solved these with workarounds and custom interfaces. New hot projects include deployment of parallel technology for general purpose computing and figuring out ways to use multimedia as a user interface that's more intuitive than today's GUIs.

Look for Polynin's name in the bookstores midyear. He's co-authoring a book on the business and technical impact of massively parallel processing, relational, object-oriented and multimedia technologies.



POLYNIN

► **Richard Freyberg, Bankers Trust Co.**

Managing director Freyberg excels in small talk — make that Smalltalk. And he's betting on the object-oriented language to revitalize Bankers Trust's commercial lending business. "We need one integrated visionary system if we're going to stay in business in commercial lending," he says. Freyberg is two years into a four-year effort to re-engineer the bank's 20-year-old commercial lending system. One of the thorniest problems — and one he hopes object-oriented technology will help attack — is that few at the bank know how to maintain the current system. Why Smalltalk? Because when you're trying to build a single worldwide system to do the job of 20, the ability to experiment and rework is critical. Freyberg says object orientation makes it relatively easy to change applications. Partly to recoup project costs, co-developer IBM is selling the system. First Chicago and Continental Bank are the first takers.



FREYBERG

► **Terry Jones, Sabre Computer Services**

Wary travelers will soon be thanking Jones, president at AMR Corp.'s 2,000-strong Sabre Computer Services Division. His group's forays into wireless technologies will one day allow travelers to check on schedules and rearrange flight times from portable computers. To meet what Jones calls the "explosion of portable automation," 10 members of his advanced technology group are investigating wireless technology, including radio frequency, cellular and Cellular Digital Packet Data, which promises to make use of the existing cellular infrastructure. Other wireless applications that are either deployed or undergoing experimentation include aircraft de-icing notification, ticketing, cruise ship check-in and baggage claim. When can we expect these changes? "We'll be testing the wireless check-in system in the first quarter of 1994," Jones says. He says he foresees an ongoing study of wireless technology.



JONES

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256KB L2 Cache standard	<ul style="list-style-type: none">• Maximizes Pentium processor speed of operation
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Easy Promises/Hard Realities

YOUR SPOUSE SAYS YOU'VE TURNED INTO A CYNIC. IS IT ANY wonder? You've heard so many sell lines about miraculous devices, magic-bullet tools and no-training-needed packages that you automatically check with three people just when you need to know the time.

But that's OK. You've figured out how to find reality through the haze: You simply add a year to most release date estimates, subtract several thousands from reported installed base, factor in an extra third to cover unmentioned incidentals, assume a baker's dozen of bugs and never, ever take the word "seamless" literally. Just think of it as survival math.

IN THIS SECTION

You want support tools that will get you the right data to answer today's big question without a lot of painful fumbling? Maybe tomorrow. Page 53



Just hook those systems up and they'll all play together nicely. Yeah, sure. Like Barbie and Crocs. Page 57

Just face it: There's ALWAYS a backlog. Page 66

OUTTAKE

"Too often what is delivered is what's easy to automate and put on a screen. It's a good cover on a bad book." JAMES HARRIS, HENDERSON CONSULTING

THIS IS PROGRESS

One-minute Advantage

Good news: Competitive advantage is real
Bad news: It disappears in a flash

BY MELINDA-CAROL BALLOU AND DEBER SLATER

COMPETITIVE ADVANTAGE AIN'T what it used to be. Just a few tumultuous years ago, it was possible to get a stranglehold on a market using information technology. (Remember those twin colossi, AMR Corp.'s Sabre and American Hospital Supply?) Of course, corporations still seek information-enabled market advantage. And some of them even find it. It's just that nothing seems to provide quite the same grip anymore.

A one- or two-year headstart is about the best anyone can hope for these days, according to corporate information systems managers. The pace of technology is shifting too rapidly to allow more than that.

Enron Operating Co. is a prime example of a company that has given itself a lead but must keep running to stay ahead.

A year ago, the Houston-based petrochemical firm, parent company for Transwestern Pipeline,

moved to client/server and inaugurated an interactive bulletin board for pipeline customers to use as a sort of commodity exchange in disposing excess capacity.

These innovations in customer service helped Transwestern hold its lead in a competitive market, according to industry analysts. But the majority of pipeline companies are now moving to client/server, so Enron can't count on what it did yesterday to ensure customer loyalty tomorrow. According to Mike Channessa, vice president of MIS at Enron, the company is already laboring to give customers even greater access to on-line data and the ability to execute contracts electronically.

That's one of the big catches to competitive advantage today. Because technology keeps advancing so quickly and on so many fronts, systems are outdated almost as soon as they are built.

"We're talking in terms of a year or less for technological changes," which limits the lifespan for competitive advantage based on [information technology]," says George Jones, managing director at the Chicago offices of ISG Consulting, Inc.

NOT MUCH TO CHOOSE FROM
Another tricky aspect of running the technological edge in search of new markets and big chunks of share is the fact that much of what's out there is still rough or even partially formed.

Progressive Insurance Corp. in Cleveland is grappling with those hazards as it re-engineers itself, shifting to a new pricing structure, new work methods and — "where appropriate in terms of cost and function" — a new client/server architecture.

Two major goals prompting these changes, says Chief Information Officer Allan Ditchfield, are the ability to target promising new markets better and settle claims faster than other insurers can. Progressive customers, he says, should be able to walk away from a car accident with an insurance check in hand.

While Ditchfield expects to be ahead of competitors by a year and a half or so when the project is completed, Progressive is having trouble finding a robust, client/server transaction-processing system. Ditchfield says the limitations of current technology could limit the advantage the company actually gains.

One comfort for Ditchfield and others who have moved outside the safety of the familiar is search



“IT'S REMARKABLE HOW MANY PEOPLE BUY THE VENDOR LINE THAT ‘IF YOU JUST BUY [OUR] CLIENT/SERVER, MULTIMEDIA OR WHATEVER, YOU’LL ACHIEVE YOUR DREAMS.’ WE WOULDN’T BUY A CAR ON THAT BASIS.”

JIM MOORE,
ERNST & YOUNG

of a bigger market presence for their companies is that the risks involved may cause some competitors to hesitate.

Any company that isn't willing to bear considerable upheaval won't be able to follow in Progressive's footsteps, Ditchfield says, because system changes his company is undertaking also demand radical organizational change.

READY FOR RISKS?

It's possible there is a correlation between sustainability of competitive advantage and the risk tolerance of a particular industry.

Certainly the hottest hotbeds of competitive one-upmanship right now are industries such as financial services, where risks and high stakes gambles are a way of life.

And what do such investments buy you, ask?

Well, not as much as they used to, it's true. But for financial services firms, a small improvement can still mean a lot.

"Since they move billions of dollars through their organizations, if they can improve their operations on a percentage basis, that's a lot of dough," explains David Frankel, director at Sanby Group, Inc., a Minneapolis-based market research firm.

Mid-Atlantic correspondent Thomas Hoffman contributed to this story.

Whole lotta guesswork goin' on

Decision-assist technologies have never quite lived up to expectations, but there's still hope

BY ELLIS BOOKER

A LITTLE INFORMATION USED TO GO A long way. But that was before delayering, decentralization and the flattened organization. Now decision-support systems—and their upper-management off-spring, executive information systems (EIS)—are trying to catch up with a demand for instant data-as-you-like-it that far outstrips their current capabilities.

The need for automated tools to navigate through piles of data and statistics has arguably never been greater. Companies are routinely collecting dizzying amounts of internal and external data and simultaneously trying to put any actionable information into the hands of more employees.

Most decision-support tools aren't up to that kind of heavy-duty use. Deemed inflexible and requiring excessive maintenance, and tweaking traditional decision-support applications are not what most would call an ideal tool for general data access.

Many decision-support systems have

been made more approachable with the addition of graphical interfaces, but under that cover is usually a system built to handle a narrow band of routine queries. Fast-changing requirements and inexperienced users were not in the design plans.

INTELLIGENCE A MUST

Because flexibility and adaptability are so critical, many observers are convinced that the next phase in decision-support systems will be the addition of intelligent software "agents."

If they work as advertised, agents will monitor complex transactions, processes and databases, all the while keeping track of the preferences and behaviors of their human users.

For example, a product released earlier this year by Comshare, Inc. uses agents to notify users of exceptions and to guide them to the source of the problem. "If sales are down in Western Europe in one product line, the agent brings them to that set of data and screens," says Clare Gillan, director of information access at market research firm International Data Corp.

Other important developments on the horizon for decision-support involve massively parallel processing (MPP) systems for quickly sifting through databases, and visualization techniques for comprehending multivariable, dynamic data sets.

Until now, MPP and visualization have been largely the province of scientific/technical computing. The hope, however, is that open system-based MPP platforms, running commercial relational databases from the likes of Oracle Corp., will make it feasible for many more end users to tap the power of MPP to examine large stores of data. Visualization systems may prove the best way to "see" these complex data sets, which often have several dimensions.

A handful of retailers, consumer packaged goods companies, credit-card companies and Wall Street firms have been kicking the tires on these decision-support systems. Most have been reluctant to share the details of their investigations, but American Express Travel Related Services Co. recently revealed that it was testing an MPP application, dubbed Quantum, for sifting through its large customer database. a

GONE, BUT NOT FORGOTTEN

Years of major transition, such as 1993, inevitably take a toll on technologies, projects and architectures that can't keep up or don't pay off. Here are a few of the more notable failures, reverses and renaissances of 1993:

ITCHEN BAKERS LIGHTCUTURES: DOWN THE DRAIN

DIGITAL'S NETWORK APPLICATIONS SUPPORT (NAS): The NAS-based architecture was supposed to provide a variety of client systems with access to various network services and resources. Digital quickly retreated on integrating heterogeneous client-server systems, including Novell, Inc. and Microsoft Corp. products, through its Pathworks family.

IBM'S SYSTEMS APPLICATION ARCHITECTURE: This NAS equivalent was supposed to provide consistent services and networking environments across IBM's mainframes, midrange and PC platforms. Now IBM is focusing on integrating customers' mixed-system client-server and networking installations through Blueprint, a multilayered software architecture introduced in 1992.

USER PROJECT REVERSALS

DIGITALWAYS' NATIONWIDE IBM RECONFIGURED CLIENT/SERVER SYSTEM: The company was apparently shambled, or at least militantly not back, by plans for a rollout across the U.S. division of DHL Worldwide Express. Michael Linder, who was hired as COO to reorganize DHL America's computing strategy and information systems department, left in 1993. He said, because of the pullback.

THE POSTAL SERVICE'S POSTAL BUDDY: The Postal Service printed the plug on the user-friendly, PC-based mailing block that processed changes of address forms and displaced stamps and other items at 183 post offices, supercenters and shopping centers around the country. The Postal Service claims that the Buddy did not generate enough revenue, but some sources say any profits melted.

AMER'S COMPRESSOR REPAIR KIT (PRO-BEST): This product is now in a Dallas conference on assemblies. One AMER's grand vision was to provide a common, repairable system to the hotel and rental car industries. Conforms deteriorated into \$1.28 million green-painting battle, com-

pleted with charges that AMER covered up problems. Former AMER partners Marriott Corp., Hilton Hotels Corp. and Budget Rent A Car, Inc. are trying to recover costs and any usable code. The three have had to make alternative plans for their reservation systems future.

WOULD-BE STANDARDS THAT DIDN'T MAKE THE GRADE

ADVANCED PERI-TO-PERI INTERNET

WORKING: Proposed by Glenn Systems, Inc., a year ago in a "brownie" attempt to drive a Advanced Peri-to-Peri Networking, this protocol was officially abandoned in August. The router vendor is now pushing another protocol that, the APPI, routes data over a TCP/IP backbone: IBM's Data Link Switching protocol.

OPEN SYSTEMS INTERCONNECT (OSI):

Until this year, OSI had at least two champions left: IBM and Digital Equipment Corp., at one time once-copied each other on OSI-based "openness," continues to support it but have clearly accepted the reality: TCP/IP is the inter-networking protocol of choice for most users.

—ELIZABETH HENNEY

BIG IDEAS AND LANDMARK PROJECTS THAT SANK LIKE STONES

WHY THE NEW WYSE X-TERMINAL

Only five X-Terminals meet the most stringent demands imposed by Wyse. Choose anything less and you just might end up with a bunch of ex-terminals.

without sacrificing productivity.

With Wyse you can do just that. Compatibility with Sun, DEC, SCO ODT, HP, IBM RS/6000



WX-17M 17" monochrome
X-Terminal, 1280 X 1024 resolution,
MIPS R3000A Architecture at 25 MHz.

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1280 X 1024 resolution, MIPS
R3000A Architecture at 40 MHz.

WX-19M 19" monochrome
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MIPS R3000A Architecture at 25 MHz.

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1024 X 768 resolution, MIPS R3000A
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INTRODUCING A LARGE FAMILY IN THE NEW X-GENERATION—THREE COLOR, TWO MONOCHROME.

Wyse brings to the X-Terminal world a wide array of color and monochrome displays, ranging from 15- to 19-inch screens. They feature 256 colors and high resolution for sharp, clear images.

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100,000 XSTONES AT ROCK-BOTTOM PRICING.

Ideally, you should be able to add seats in a workstation environment at a reasonable cost,

and other standard UNIX platforms is assured. Fast text and graphics operations are provided by more than 100,000 XStones of performance.

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The powerful MIPS R3000A RISC-based architecture makes a move to the new WX series of terminals—a Wyse move indeed. The fully optimized server lets you take complete advantage of the high performance processor for X-specific applications.

S WON'T BECOME EX-TERMINALS.

And the easy-to-use software allows you to access all your local clients with a simple keystroke.

FIVE MILLION MORE REASONS W SHOULD COME BEFORE X.

Sure, we could list a few dozen other features here. Like local client support with window managers (Motif,[™] Open Look[™]), or networking with TCP/IP, DECnet, LAT, and other protocols. But the key fact is that five million Wyse terminals already function

reliably in the business world. Which makes it a sure bet that the new WX line will be hard at work long after others have become X-tinct. Call 1-800-GET-WYSE for details on the new family of X-Terminals from Wyse.

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The productivity chase

Proof that technology pays off remains elusive

BY GARRY RAY

IN THE LATE 1980s, A CIRCLE OF academics and business economists decided to investigate the connection between productivity and information technology. What they found rocked the industry and shook confidence in information systems. Despite decades of claims that new technology has improved business efficiency, they proclaimed, there was no evidence that it had any significant positive impact on productivity.

Although some economists have lately decided that productivity is again on the upswing, the original studies touched a raw nerve in the corporate suite. Some of the ire remains even today. "Most CEOs and CFOs are extremely unhappy" with the productivity gains from technology, says Mack Hannan, chief executive of The Grey Matter Group, Inc., a New York business management consultancy.

Is that unhappiness justified? Have IS managers really missed the mark? Well, yes, in some instances they have.

"There are many ways of implementing technology, where in essence you speed up the mess," says Jim McGee, a fellow at Ernst & Young's Center for Information Technology and Strategy in Boston. In fact, McGee says, there are more wrong ways to approach computerization than right ones, and for every company that gets it right and achieves productivity improvement, he estimates there are seven or eight that do not.

But there's something else going on here, too. It has to do with the various ways in which productivity can be defined.

In the classic sense, an employee is more productive when he produces more widgets using the same amount of raw material. Then there's the more negative version, which says productivity is producing the same or greater output with fewer employees. (Witness the rising productivity picture reported by economists in the



wake of several years of massive layoffs and restructurings.)

Some observers say mechanistic productivity measurement—based on input/output volumes—is irrelevant to information technology. "The whole system for measuring productivity is built around moving pig iron," says Michael Rothschild, president of

the Biometrics Institute in San Rafael, Calif. "How do you measure the productivity increases from fax machines?"

It isn't just that information systems dwell outside the area of standard measures. They alter the processes they touch in ways that may make traditional definitions of productivity obsolete.

"At some point, a new system actually redefines the business process, which means you are changing the rules of the game," says Greg Klein, MIS manager at Sara Lee Personal Products Trading in Winston-Salem, N.C. "When that happens, going back to try to measure productivity gain is moot."

So is there any provable connection between information technology investment and productivity improvement? Essentially, that's a big maybe. Few doubt there's a connection or that information technology has some effect: It's isolating and measuring the effect that's hard. And business process re-engineering, which many experts maintain will result in a whole new realm of productivity improvement, may just complicate things further.

As McGee points out, when you reinvent a process or a whole business, you interrupt the continuity that makes aggregate measurement possible. "The more successful you are, the more problems you are going to have trying to measure it," he says. ■

BOGUS WISDOM

Don't take the word of some people. Like Dr. B. Robbins of the Computer Group, here a lot of faith in some thing called a "fully loaded" or "unloading" video is based on what it costs. It's not a good idea to use a computer to do a job that's not a computer job. It's not a good idea to use a computer to do a job that's not a computer job. It's not a good idea to use a computer to do a job that's not a computer job.

Warning: says Microsoft. It's not a good idea to use a computer to do a job that's not a computer job. It's not a good idea to use a computer to do a job that's not a computer job. It's not a good idea to use a computer to do a job that's not a computer job.

THE 'SEAMLESS' SCAM

Interoperability? HA!

"Interoperability has never been this good, but it's not as good as people dreamed it would be," says Roy Schulte, a vice president of Gartner Group, Inc.'s Software Management Strategies Group. **BY**

Descriptions such as "plug-and-play," "open" and "standards-based" pepper marketing literature for items ranging from desktop hardware to host-based software. But information systems managers say no matter what labels are attached, getting different vendors' products to work together requires intricate stitchery.

Good, but not good enough

FOR GOLDEN CAT CORP. THE MOVE TO PC networks roughly a year ago was hampered by a mysterious malady.

The South Bend, Ind., producer of cat box filter wanted to run a Token Ring network using Proteon, Inc. adapters, Novell, Inc.'s NetWare and Windows-based PCs to access data on the IBM AS/400 midrange host. Software from IBM was to provide the gateway service between the AS/400 and the PC network. But when users tried to connect to the AS/400, the network crashed in five minutes.

After two months, a systems analyst replaced a Proteon adapter with an older IBM card, and "performance improved a thousand times," says Thomas Palmer, vice president of IS.

Still, it was a breakthrough only in identifying the problem, not a solution.

The systems integrator got the Proteon cards to work by replacing the NetWare Open DataLink Interface (ODI) drivers with IPX drivers.

But Palmer says he wants to move to Novell ODI drivers because that device driver is necessary to allow

users to run multiple protocols on the same network adapter card without rebooting.

According to Palmer, Proteon promised to work on the problem in July, but he hasn't heard back from them.

"One of the most frustrating things is that I keep telling my staff that we can't be the only AS/400 site that's been through this, but there's not a lot of information that is easily accessible," he says. ■

E-mail off schedule

AT THE COLLEGE OF BUSINESS AT Oregon State University in Corvallis, electronic mail is a way of life.

So in August, when the Microsoft Corp. gateway software that translates messages between the business school and the campus Internet host stopped working, computing services manager Greg Scott had his hands full.



"What do I tell the dean when his mail doesn't reach the provost?" Scott Dean, the gateway was down," he asks?

Scott installed an updated version of Microsoft's Simple Mail Transport Protocol (later met's messaging protocol) gateway software but still couldn't get proper interoperability.

"Sending messages out worked all right, but when the gateway received messages, the IP connection got lost and the gateway became inoperative," Scott says.

To fix the problem, Scott first talked to Microsoft technical support people, but their technical advice didn't stretch to the level of bugs and faulty architecture.

During the next eight weeks, Scott and his staff spent 300 hours working on the problem. Scott moved the gateway machine from the downstairs computer room to his office, 10 feet away from

his desk, "so I could really keep my eye on it."

Finally, Scott and his staff worked out a temporary solution by setting the gateway to reboot every six hours. However, that canes mail delivery delays.

"For years I would listen to people moaning about their gateway services and I would snicker," Scott says. "Now I'm in a bind. But there are so many variables that it's not clear what causes the problem, and it's not productive to get into finger-pointing." ■

Between the lab and the real world

THE NATURE OF CHARLES STALLINGS' job as senior communications engineer at MCI Communications Corp. in Colorado Springs is to get "everything in the telecommunications network to work with everything," he says.

That's a tall order even for a company that specializes in such things. For instance, MCI moved a high-speed Fiber Distributed Data Interface network over copper cabling from pilot to production last year after investing "cabling, sweat and tears" to get the cabling, adapters and workstations to cooperate with one another.

However, once in production, problems cropped up that hadn't occurred in the lab. Cable lengths runs of 330 feet worked fine in the lab, but shorter runs didn't work in production. Workstations that worked with the cabling during tests did not work in real use. Stallings reports.

The only way to fix the problems is to "tweak" the various components into

compatibility. Stallings says.

There's relief on the horizon, however. Stallings is confident that vendor alliances such as the one announced in August among Compaq Computer Corp., cabling supplier TTI Datacom and LAN vendor Syteknet, Inc. can help because they guarantee compatibility. ■

KNOW YOUR VENDOR-SPEAK

BY JEAN S. BOZMAN

Users say they sometimes get the strong impression that glowing vendor descriptions in glossy product brochures may be a bit overstated—or misleading. (Yes, really.) Occasionally, they wish they could get on-the-spot interpretation of what the vendors actually meant to say. At right is a quick reference guide for the open systems shopper.

WHEN THEY SAY THIS:

- ▶ "Provides interoperability among standard computing platforms."
- ▶ "We have powerful and cost-effective servers."
- ▶ "Our customers have the benefits of modularity."
- ▶ "We deliver support for industry-standard application programming interfaces."
- ▶ "Our product improves resource usage, response times and availability and also maintains service levels."
- ▶ "We can deploy our objects in a heterogeneous environment."

THEY REALLY MEAN THIS:

- ▶ "We'll do Windows and Unix first, and you can hold your breath waiting for the OS/2 and Macintosh versions."
- ▶ "We finally reduced our outrageous prices."
- ▶ "Which we use to try to sell you bigger and bigger machines."
- ▶ "We couldn't figure out any other way to make this product operate with any other vendor's product."
- ▶ "We simply ran out of sensible things to say."
- ▶ "After you've paid us, good luck ever finding them again!"

Still backlogged after all these years

Make a dent and demand goes up

BY MELINDA-CAROL BALLOU AND DEREK SLATER

With so many spiffy new development tools hitting the market in the past few years, many information systems managers dared to hope the application backlog—that long queue of software projects awaiting attention—would be a thing of the past by now.

It hasn't quite worked out that way...yet. Some IS executives say they are making progress, but others say they are falling further behind.

"Our latest research shows the backlog continues to increase because the complexity of the business has increased so significantly," says David Sharon, president of CASE Associates, Inc., a consulting firm in Oregon City, Ore.

Our own research is slightly more optimistic, but only slightly. Of 101 IS executives polled by *Computerworld*, 37% said their application backlogs have decreased during the past three years. However, an offsetting 34% reported that the pile of undeveloped applications has grown.

Burroughs Wellcome Co. illustrates some of

the most common obstacles to taming the backlog monster—unrelenting user demands and the time it takes to become fully fluent in the new development tools. The company is five years into the development of an enterprise-wide clinical-trial monitoring system and hasn't been able to make a dent in its backlog despite new tools such as Powersoft Corp.'s PowerBuilder software.

"Eventually we hope to cut down the backlog with these tools, but we're too new in the arena to have made a dent," says project leader Greg Corbin. "We're approaching a huge learning curve." Since Corbin's team began work on the clinical-trial monitoring system, they have placed all other application requests on the back burner.

While IS is wrestling with complex strategic projects, application requests continue to flow in. More than 75% of the IS executives surveyed by *Computerworld* said departments are asking for new applications more than ever.

Even fix-it-up projects aren't simple anymore, Sharon says. When end users ask for changes to existing systems, they aren't talking about adding a new feature. "The requests are for major overhauls of core programs as the company changes policies and manages acquisitions and mergers," he says.

Another problem, some users say, is that tools such as PowerBuilder and Gupta Corp.'s SQL Windows, while helpful, lack the muscle for developing big-end applications. Key missing features are configuration management and front-end design capabilities, though vendors are scurrying to link up with computer-aided software engineering tools to provide those functions.

PROGRESS MAKES PERFECT

Still, many users are making progress thanks less to application development tools than to do-it-yourself aids such as PC report writers and organizational/procedural reforms.

PC report writers, which allow the handling off of routine tasks such as query creation to end users, have been a real boon for some organizations, freeing programmers to concentrate on more complex applications.

Standardizing development techniques can also speed development. Establishing preferred technical architectures—standard choices for database managers, communication protocols, server configurations, etc.—has made a significant difference at Bankers Trust Co. in New York, according to Glenn Shimamoto, a vice president there.

"A lot of things were loosey-goosey. Firing that up means that individual project teams don't have to worry about architectural issues and can assume a template of some sort," Shimamoto says. ■



CW SURVEY

STATE OF THE BACKLOG



BOGUS WISDOM

Many members are trying to build up their skills, and are generally open to making progress. In fact, many are using PC report writers and other self-help tools to do it. But many are also still waiting for a more powerful tool to help them.

Many members are trying to build up their skills, and are generally open to making progress. In fact, many are using PC report writers and other self-help tools to do it. But many are also still waiting for a more powerful tool to help them.

Computerworld® Index

HOT NOT

GENERATION GULF

Percent of adults ill at ease using a computer: 23%
Percent of teens: 7%
Source: Self Computer Corp.

IF AT FIRST YOU DO SUCCEED...

No. of days it took Next to sell 50,000 machines: 2,920
No. of days it takes Apple to sell the same amount: 9

Source: Steve Jobs and the Next Big Thing (Villard, 1993)

YOU GET WHAT YOU PAY FOR

Average daily salary for a trade show model: \$250
Average daily salary for a senior systems analyst: \$180

Source: Mary Smith Agency; CW Salary Survey

AGONY OF DE FEET

No. of miles on the Comdex/Fall trade show floor: 22
No. of miles of road at Disneyworld: 160

Source: The Interface Group; The Walt Disney Co.

DOWN AND OUT

No. of species on the worldwide endangered species list: 1,200
No. of employees released from IBM in 1993: 34,000

Source: Department of the Interior U.S. Fish and Wildlife Service; IBM

NATIONAL TREASURES

Estimated worth of Bill Gates: \$6.16 billion
GDP of the nation of Iceland: \$5.6 billion

Source: Forbes magazine; The World Bank

KNOWLEDGE BY THE POUND

Average weight of a 1994 notebook computer: 8 pounds
Average weight of the adult human brain: 3 pounds

Source: BIS Strategic Decisions; 1993 Microsoft Encyclopedia



The Internet

Everybody wants access

Subnotebooks

Small, portable, powerful

Microsoft bashing

Everyone does it

Product suites

All-in-1 at a better price

Frame relay

It's here

Re-engineering — before you do it

Theory is great

AT&T

See, phones and pictures can work together

Direct database connections

Difficult but worth it

Prodigy

Not profitable, backed away from flat-rate pricing

Laptop PCs

A retro commodity

IBM bashing

Why kick an icon when it's down?

Stand-alone PC apps

Prices plunging and integration's the thing

ATM

A lot of PR fanfare

Re-engineering — after you do it

Hidden costs, disgruntled staff

AT&T

Bureaucracy with a little frosting

ODBC

Users give up too much functionality, performance and stability

Simply hot, hot, hot

Multimedia

This is (finally) the year

Object-oriented programming

The introduction of a slew of tools in '94 will make this fall out of the clouds. Remote is a perfect hook for fragal times.

Parallel processing

Links to client/server tools and surge of interest in pattern identification resurrect this obscure of interest category.

PowerPC

With the Apple/IBM/Motorola power behind it, will give other RISC chips a run for their money.

Simply not, not, not

PDA's

Praised to Disappoint All. We'll have to wait till '95 for production-mode products.

Pen-based computing

They still can't read what you write.

Cyber or virtual anything
Hollywood may like this one, but it projects on a screen better than it plays.

ISON

It's IBM's Dead Network.

Convergence of TVs, computers

The amount of debt piled on cable companies and the fundamental differences between the TV user and the computer user will work against this area.

Source: CW staff; New York, IBM Corp.; R. Dean Meyer, NEMA, Inc.; George F. Gentry, Forrester Research, Inc.; Richard Feldman, Performance Computing, Inc.; Neil Lavin (unlabeled)

WHAT I'M READING

► **Michael Hammer, President, Hammer & Co.**

• *Things That Make Us Smart* by Donald A. Norman (Addison-Wesley, 1993). "Don Norman is a cognitive scientist who understands people, machines and how they relate. His works are essential for anyone who will ever design a user interface."

• *Bureaucracy* by James Q. Wilson (Basic Books, 1989). "While focused explicitly on governmental agencies, this book offers profound insight into how all large organizations take on lives of their own."



► **Gordon Bell, member of various boards, consultant and inventor of Digital Equipment Corp.'s VAX.**

• *Game Over: How Nintendo Zapped an American Industry, Captured Your Dollars and Enslaved Your Children* by David Sheff (Random House, 1993). "Nintendo has one of the largest installed bases of any computer, so it's an important system to understand. What happened with that machine may have relevance to other systems."



► **Phillips Kahn, CEO, Portland International, Inc.**

• *The Virtual Corporation* by William Davidow and Michael S. Malone (Harper-Business, 1992). "It's a new way to think of partnerships and helps you get maximum benefit to customers while minimizing management headaches."

• *Anecdotes in Modern Art* by Donald Hall and Pat Corrington Wykes (Oxford University Press, 1990). "It's an incredible peek into the universe of some of the most creative people who ever lived — from Rousseau to Warhol. Fascinating and humbling."



► **Bill Gates, Chairman, Microsoft Corp.**

• *The Intelligent Investor* by Benjamin Graham (Harper & Row, 1963). "Businessman and philanthropist Warren Buffet recommended it as a good book for understanding the market." [Ed note: Buffet, 1993 list of the 400 richest Americans. Gates was No. 2.]





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Success Isn't Complicated.



Notes report misread ROI conclusions

Your article "Notes goes mainstream" [CW, Dec. 13] caught us somewhat by surprise.

It reported the preliminary results of a return on investment study we are undertaking on Lotus Notes users worldwide. We appreciate the interest in our study but in the rush to bring timely news to your audience, we believe *Computerworld* displayed symptoms of the CNS disease—in the rush to get news out every flash in the sky becomes a SCUD kill.

This is not to say there was no value to your Notes article, but two erroneous statements serve to undermine the effectiveness of your story and unfortunately our study.

I was quoted as claiming that, despite the long lead times to recoup the investment, corporate buyers are still lining up to buy Notes. That was derived from your caption above our return on investment chart depicting the preliminary results of the study. Your caption read: "A survey of 70 companies that have worked with Notes for one to three years found most sites still waiting for their investment to pay off."

You are talking about *payback* while the chart clearly says *return on investment*. As a result, you have mixed up two entirely different financial measures and drew an erroneous conclusion.

The truth is, I did say "small and large companies alike obtain the same financial benefit of Notes, clearly demonstrating that this is not simply a technology for large companies."

On the financial results aspect of the story, our return on investment results are averaging at 50% or better to date, which means no one is waiting for the benefits to begin.

Once the study is completed in January, we will be happy to work with *Computerworld* to bring your readers the story behind the financial implementation of Notes.

Scott C. McCready
Principal
International Data Corp./Avante
Framingham, Mass.

Client/server preferred

In "Don't be so quick to rip the mainframe" [CW, Nov. 29] Joe Vincent stated the costs of applications on LANs are 1.5 to 2.5 times higher than on mainframes.

This form of analysis leaves out vital details. That the cost differential is so low, so early on the learning curve, is a testament to the relative ease of client/server development. And graphical user interfaces are a proven method of reducing user training and support, but their added functionality can increase the development effort, especially early in the

By the way, the caption above our return on investment chart depicting the preliminary results of the study. Your caption read: "A survey of 70 companies that have worked with Notes for one to three years found most sites still waiting for their investment to pay off."



General managers lack data knowledge

Regarding your editorial "It tells for thee" [CW, Nov. 15], it is evident that we in the business are our own worst enemies.

We export data processing people to get to know the business they serve, but we rarely demand that general management learn anything about data processing people or their unique problems.

When things are perceived as going wrong in "computerland," general management hasn't a clue who is really at fault or whether it can be fixed. They look for a scapegoat, and it's not too hard to find one.

Ignorance of technology on the part of the chief information officer is not the problem, as you suggest. Ignorance and unrealistic expectations by general management is.

Earl Gates
Deatun, Ill.

Workplace OS based in reality

I'm surprised at John Gantz's column "Will we ever land in Cairo?" [CW, Nov. 22] about Microsoft's object-oriented operating system, Cairo.

I agree that Cairo will turn out to be shadows and mirrors, but I disagree with Gantz's assertion that IBM's Workplace OS is a Cairo knockoff. That's absurd! The Workplace OS will be an object-oriented operating system built around the Mach Unix microkernel.

Paul Longene
Lincoln, Neb.

AIX, HP/UX lead the pack in openness

Your survey on open operating systems, "Who's most open?" [CW, Dec. 6], is very misleading. Why was IBM the only vendor to include both a proprietary and open operating system combined in its rating? Why was AIX not separated from MVS as was done for every other vendor in the survey?

As a result of your combining AIX and MVS operating systems, your survey results lead readers to believe that IBM's AIX is not open. This cannot be more untrue.

In D. H. Brown Associates' detailed, objective analysis of the openness of operating systems, IBM's AIX placed in the lead with HP/UX. Following HP and IBM in the third through fifth positions are Sun Solaris 2.2, DEC Ultrix 4.3 and Sun Solaris 1.1.

Donna Bleakley
Research analyst
D. H. Brown Associates, Inc.
Port Chester, N.Y.

Object Design, a key object player

"Relational threat stalks object DBMS makers" [CW, Nov. 22] dismisses all object database vendors and gives an inaccurate account of Object Design, loosely labeled as the "one possible exception" that is making money.

It's safe to say that Object Design is the company that is vaguely referenced here, since we have established our position as the dominant player in the object database market with 1993 revenue expected to hit the \$25 million mark, and have remained profitable over the last four quarters.

In addition, the chart that accompanies the article labeled "On the slow road" is a mystery to me, as I liken 100% growth of a market per year to the autobahn.

Ken Marshall
President and CEO
Object Design
Burlington, Mass.



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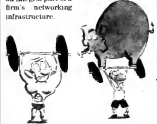
Barbara A. Brown

RDBMS a commodity and NT a winner

Patricia B. Seybold

Windows NT becomes the de facto server operating system of choice for most enterprise applications. The irresistible pricing and packaging of Windows NT and the SQL Server database management software developed by Sybase and ported by Microsoft to NT make it the platform of choice for client/server pilots in the first half of '94.

For less than \$10,000, customers will be able to deploy relational database servers that outperform many of the 1,000 RDBMS server combinations costing \$100,000. The result is the commoditization of the relational database market and the acceptance of Windows NT as an integral part of a firm's networking infrastructure.



Red herrings and green come-ons

John Gantz

While 1983 was dominated by Windows NT as its made its tortuous debut, 1994 will be dominated by its lesser alter ego, Chicago. But I expect Chicago's entrance into the market to be as blustery as its namesake city.

If Cairo is a phantom operating system, as I have suggested in my regular column, then Chicago is a red herring. It will be re-evoked in 1994 that Chicago was, in fact, developed by the Microsoft Visual Basic team as a way to sell more development tools. In order to develop software for all of Microsoft's Windows application programming interfaces (API), programmers will begin to treat the APIs as assembler language and write using the tool kits, subroutine libraries, etc. Then in 1995, when Microsoft has wrung the last out of the DOS-to-Windows conversion, it will be time to churn the base again.

Other misconceptions will also be cleared up in 1994:

The nation's largest insurance companies—Aetna, Allstate, Cigna, etc.—announce they will lay off tens of thousands of white-collar workers, at least one-third of their work force, during the next three years. They cite improved information technology systems as the economic justification for the cuts. The announcements prompt congressional hearings into the impact of new technologies on white-collar employment.

The soft dollar crisis of 1994 slashes information systems budgets in dozens of Fortune 500 companies. Those monies are allocated to human resources and general administration instead. Managers in these areas quickly come to understand why IS managers preferred dealing with machines over people.

Companies that bought all their hardware, software and network technologies on the cheap during the last three years now whine that they are receiving inadequate maintenance, support and training from vendors.

A handful of Fortune 100 companies announce they are standardizing on the Internet for their nonmission-critical internal communications and customer/vendor electronic data interchange. They're happy with their e-commerce infrastructures and predict their telecom bills will decline by 25% good luck.

By the end of 1994, Camanix, Spindler and Kover are all named to different posts with less power. General Electric announces it would like to make a friendly acquisition of Xe-



ro. Lou Gerstner is quoted as saying, "This turnaround is going to take longer than I had initially expected, but I am confident that we will see tremendous progress in 1995. We will reward the customers who have been loyal to us." GE also offers to buy 25% of IBM. NEC announces it is buying 20% of Unisys, but says it will be a passive investor.

Bill Gates announces that Microsoft's future is in consumer—not business—markets.

Imagine no new products

Esther Dyson

Yes, 1994 turned out to be an amazing year. Because of a political showdown with Ross Perot that escalated unpredictably, the Clinton administration outlawed all new technology for one year in a high-publicity attempt to save jobs.

After some bickering over what was new and what was merely "improved," vendors set to work to complete development on their existing products. By mid-1994, most products first shipped in 1983 were bug-free and operational. By year's end, most customers had installed everything they had bought, and systems integrators were figuring out how to get most existing products to interoperate.

Productivity soared, and it was productivity of a painless kind. Instead of laying off people, most customer companies found they had increased sales, improved quality and customer service, and could reemploy workers.

As we head into 1995 and vendors are free once again to ship new products, debate rages: Does anyone want them?



about as well as the mergers and acquisitions of the 1980s did for entering the computer, software, management consulting, real estate investment and PC retailing markets. This time the telcos will be able to lose money on an even grander scale—perhaps trillions, instead of billions.

THERE ARE HUNDREDS OF REASONS TO USE WINDOWS NT. AND ONE GREAT REASON TO TRY IT NOW.

Experience the new generation of applications

For a limited time, see how the new generation of 32-bit applications for Windows* can change the way you work and make you more productive. When you get the Microsoft® Windows NT* operating system for the special price of \$295, you'll get a free CD-ROM Windows NT Applications Sampler.

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Get Windows NT today for only \$295 and we'll send you a free CD-ROM Applications Sampler. But order today. This limited-time offer ends February 15, 1994.



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Forecast '04: Desktop Computing

The way things ought to be

OPINION BY DAVID COURSEY

GERHART RUSH LINBAUGH, IT'S NOT MERELY that we disagree on almost everything. It's that I'm convinced Rush is far more interested in lining his pockets than in seeing his vision actually come to fruition.

Still, you have to give the guy credit. At least he's out there saying something. And if one good idea takes root, perhaps it is OK after all. So, it's in that spirit—that this column does little to line my pockets—that I'm stealing the title of Rush's book to offer my own list of modest proposals for the new year. And you have my unconditional guarantee: I would be thrilled if all my suggestions were implemented, though I will continue breathing normally while I wait.

1. Microsoft needs to admit it's never going to be a local-area networking company and start working with Novell instead of looking so foolish trying to build a LAN operating system over and over again.

2. The Redmondians could also give us a target date for when an object-oriented database and engines for text processing, graphics and mathematics are going to start shipping as part

Courtesy, page 68

What users demand of 32-bit

Vendor promises fail to convert many users to 32-bit operating systems

By Ed Scanlon

For years, or so it seems, IBM and Microsoft Corp. have promised users that 32-bit operating systems such as OS/2 and Windows NT would cure cancer, cost a dollar and taste like chocolate. In other words, they would be the panacea that cures all their desktop computing ills.

But so far, many users have remained sick, spending quite a bit more than a dollar for cures that taste more like cancer oil. But given what IBM recently delivered and what Microsoft and companies such as Next Computer Inc. promise to deliver, 1994 may be the year many users get well.

What users are demanding of 32-bit desktop operating systems in 1994 is what they have always wanted: ease of use, speed, loads of applications and a product that doesn't require lots of expensive hardware.

"While they advertise that their staff [operating systems] is so easy to use, most of these vendors are still making products designed more for power users than for grassroots users," said Mike Drips, a Windows beta user and consultant in Tampa, Fla.

Sticking with 16-bit systems

"Until some of these guys [IBM and Microsoft] can deliver something for the desktop that doesn't require a mini-Cray to run, I have to stay with my 16-bit hand," said one information systems manager who has beta-tested dozens of IBM and Microsoft operating systems.

If Microsoft delivers Windows 4.0, code-named Chicago, with all of its 32-bit glitz and polish and there is a raft of 32-bit applications available, corporate users may finally believe in that 32-bit religion.

Microsoft says it expects to ship 50 million copies of the product in the first 12 months of availability. Given International Data Corp.'s prediction of 80 million PCs to be shipped in 1994 and that Windows 3.1 now ships bundled on almost 70% of all machines worldwide, a few observers said they do not find that prediction so outlandish. However, Chicago's document-centric interface, which Microsoft has only vaguely described to date, may finally evaporate the longstanding user complaint that 32-bit operating systems are too hard for average users to handle.

"People more naturally know what to do with their tried-and-true application to get their job done than with some of the more obscure desktop metaphors they have now," said Dan Spivey, a PC coordinator in Gaithersburg, Md.

Chicago fans

Users also like the modular characteristics of Chicago, which may allow them to use less expensive hardware, as well as the system's plug-and-play aspects — which give them flexibility in customizing hardware combinations.

While IBM has not revealed any plans for significantly changing OS/2's interface this year, one IBM executive said the company will alter its file system, making it easier for less experienced users to get at the system's 32-bit power.

While IBM says users can get some use out of OS/2 with 4M bytes of memory, to do productive work still requires 8M bytes. The long-promised 4M-byte version of the operating system still appears as far away as it did a year ago.

What may haunt OS/2 throughout the next year is the failure of Top 10 developers to provide applications that are written specifically to take advantage of OS/2's 32-bit properties.

Operating systems, page 69

Microprocessing

Apple PowerPC takes on Intel

By James Daly

Ten years after Apple Computer, Inc. took on IBM for dominance of the PC industry with the introduction of the Macintosh, the company is once again spooling for a fight.

This time Apple has chosen an equally formidable foe — Intel Corp. — and in an ironic twist has teamed with former archenemy IBM to do the job.

At this week's Macworld Exposition, Apple is expected to show Macintoshes based on the PowerPC microprocessor, the chip forged by the alliance of Apple, IBM and Motorola Inc. The PowerPC-based Macintoshes will not be announced or available until March, but the transition to the PowerPC is a critically important one for the Macintosh architecture.

"Apple has put all its chips on the table with PowerPC," said Doug Knox, an analyst at The Viewpoint Group in Santa Cruz, Calif.

Apple is literally betting its future on PowerPC. Within two years, Apple will produce nothing but PowerPC-based Macintoshes because "the old architecture has simply run out of gas," said Chief Executive Officer Michael Spindler.

It's now or never

Some analysts said it is the last chance for true competition in the microprocessor market. The computing world essentially belongs to Intel and Microsoft Corp. Tens of millions of computers using Intel's 80386, 486 and Pentium chips are already in use, and businesses have invested billions of dollars in software linked to those chips. Microsoft is selling an estimated 1.5 million copies of Windows each month, most going out the door with an Intel-based computer.

With increasingly large applications gobbling up precious computational resources on all platforms, Apple will market the PowerPC as a speed demon. PowerPC Macintoshes running at 60 and 80 MHz will run Macintosh applications at about the speed of today's high-end systems, but applications written natively for PowerPC will run two to four times faster, said Apple spokeswoman Betty Taylor.

Apple has a strong ally in IBM, which has also shown systems using the new chip and said it

The PowerPC Macintosh

What's in store		
Model	CONTINUATION	AVAILABLE
PowerPC 601	Will be used in initial midrange and high-end Macintosh systems.	March 1994
PowerPC 603	Designed for the high-volume desktop Macintoshes, as well as portable PowerBook and Duo models. Also suited for embedded controller applications. Offers performance similar to the 601 in a lower-power, lower-cost design.	Mid-1994
PowerPC 604	Will eventually replace the 601, allowing for better performance in midrange and high-end Macintoshes.	Late 1994
PowerPC 620	Intended for high-end products offering premium performance and a full 64-bit architecture. Designed primarily for high-performance workstations and servers.	Mid- to late 1995

will use the PowerPC chip in mainframes and laptops as well as desktop and workstation systems. Apple officials said such a commitment could have a peripheral benefit for the Macintosh as well.

Another plus for the PowerPC chip is that it, Apple, page 69

The new ProLinea Net1 features a sleek design

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MANAGED TO TRACT COSTS. PLIES.



with an integrated monitor. But despite the extremely small footprint, it's anything but meek.

For starters, there's an integrated network interface for either Ethernet or Token Ring environments.

And it comes with a 486SX/25 processor and includes an extra-sharp 14" SVGA display.

The new ProLine MT, on the other hand, features a mini-tower design with five slots and five bays. It includes Local Bus Graphics and is available in three processors, from 486SX/33 to 486DX2/66, and all are upgradeable to Pentium technology.

While each ProLine is unique, they all share features in common. Every ProLine is already loaded with MS-DOS 6 and MS Windows. And each also includes TabWorks, a new software interface available only from Compaq that makes using Windows even easier. (And you more productive.)

Of course, no matter how many different models we make, each one has to be aggressively priced to continue the ProLine

tradition. That's why the ProLine Net1 starts at just \$1,099, the mini-tower at \$1,449, and multimedia models at just \$1,549.* All of which is good math no matter how you calculate it. For complete details, just call 1-800-345-1518. **COMPAQ**

Mobile computing

Digital assistants to come of age in 1994

By Michael Fitzgerald

Users and vendors will look at personal digital assistants (PDAs) through a magnifying glass in 1994, trying to see just what these devices might offer. It may be a while before they see much, however, as certain key PDA developments will not take place until late in the year.

PDAs in 1994 will be "almost like when creatures first came out of the water onto the land," said Jeffrey Henning, an analyst at BIS Strategic Decisions in Norwell, Mass. "A whole lot of things were spawned, and the question was who would survive."

Open communications

PDAs have the potential to allow users to easily swap data from one system to another, including synchronizing personal contact files. They could also allow remote access to desktop files and electronic mail during meetings and more immediate communications links.

Henning said he expects to see products from at least 15 vendors come into the market in 1994. Many vendors, such as IBM, Compaq Computer Corp. and Toshiba America Information Systems, Inc., have already announced their plans to enter the PDA market. Some, such as Motorola, Inc. and Sharp Corp., have announced plans to build multiple types of PDAs — Motorola, for instance, will build a wireless handheld under General Magic, Inc.'s MagicCap operating system. Apple Computer, Inc.'s Newton technology and Microsoft Corp.'s At Work for Handhelds. There is the Microsoft/Compaq/Intel Corp./VLSI Corp. Mobile Companion effort, expected to ship its first product in mid- to late 1994.

Meanwhile, current PDA makers, such as Apple and AST Research, Inc./Casio, Inc., will continue to enhance their products.

Despite the potential wait, BIS managers said

they will watch the developments.

"We're very interested in that whole process because we're trying to get the users closer to the patients, rather than being tied to their desks," said Wayne Robertson, systems administrator at Saint Agnes Medical Center in Fresno, Calif. Robertson said Saint Agnes has 11 buildings spread out over three quarters of a mile, and it would be helpful to give doctors and nurses access to patient information from wherever they are.

Said Michael Stonecipher, office systems manager at United Missouri Bank in Kansas City, "I see some real potential out there for these to have business application, and that's why I'm getting so excited about PDAs."

United Missouri's auditing department just ordered 30 Newtons to manage its financial application software. It liked Stonecipher said. United Missouri owns banks in four states, and PDAs might help banking auditors keep in touch and gain access to certain financial information, he said.

PDAs
BIS Strategic Decisions
projects rapid growth
in unit sales for PDAs:



Analyst Jeffrey
Henning expects
growth from at
least 15 vendors
in 1994.

Good for what?

Vendors will join users in trying to figure out just what PDAs are good for. While support for E-mail and file transfer is considered important, "we may find that it's probably more important to support business-card 'beaming' than many other features," said Brian Dougherty, chief executive officer of Geoworks, Inc., which has a PDA operating system used by AST and Casio, among others.

Whatever happens in the next year, some think it will take a while for PDAs to mature into a solid market, just as the PC took time.

"Nobody's going to get rich on these things in the next few years," said Andrew M. Seybold, editor of the "Outlook on Mobile Computing" in Brookdale, Calif.

Coursey

CONTINUED FROM PAGE 65

of some future operating system. Then we can calibrate our wishes for how long the mile crase — in the Big Four horizontal desktop productivity applications themselves [spreadsheet, word processing, database, graphics] — will last.

3. Apple needs to go ahead and give its executives signs reading "Will run business unit for food" and send them onto the streets of Cupertino. If the high-growth, high thought demanding, perhaps they will start making more of their products work together in some reasonable fashion. Or decide what businesses the company wants to be in and create something truly interesting. So many good ideas, such poor execution.

4. Customers need to say no. Try telling a few of your vendors that. No, you aren't going to commit to their next-generation whizzy gizmos until they make the

whizzy gizmos you already have work as promised.

Watch them cry.

5. Novell needs to "promote" Ray Noorda to chairman emeritus today and hire an outsider as CEO. Then it needs to make Unix the cornerstone of its business and PowerPC the preferred platform.

6. AT&T needs to buy both Apple and Novell as a means of providing adult supervision for a couple of companies that really need it. It would also make AT&T the real challenger to Microsoft's domination of the industry. 7. One measure of the success of the new team at WordPerfect will be how quickly it gets its electronic mail calendaring/scheduling package — now called WordPerfect Office — renamed. Besides the fact that it's misleading for a mail package, customers would much prefer the WordPerfect suite of applications to something called the Borland Office, on offense to my friends at Borland.

8. The media needs to stop harping on the Internet and digital convergence and find something else to malign. We need developers to imagine great products, not the money they can make by creating monopoly markets

Vertical applications will build on suites

By Michael Vizard

As the PC application industry moves into 1994, information systems managers are likely to notice a subtle shift concerning how vendors will position their applications.

Rather than being simple end-user productivity tools, all four major software vendors — Microsoft Corp., Lotus Development Corp., WordPerfect Corp. and Borland International, Inc. — will list PC applications as a base for building client/server applications.

More macros

To accomplish that goal, they are adding more robust macro languages to their applications that can be used across multiple packages. In fact, many of these macro languages may be familiar to end users since they are primarily based on derivatives of Basic.

For example, Microsoft is bundling Visual Basic in PC applications, and Lotus plans to bundle LotusScript in its offerings. LotusScript is a derivative of Visual Basic that will run cross-platform and features several object extensions.

Meanwhile, Borland will bundle its own object-oriented scripting language in Borland Office, which consists of its Quattro Pro spreadsheet, Paradox database and WordPerfect's namesake word processor.

Residing underneath these languages will be Version 2.0 of Microsoft's Object Linking and Embedding (OLE) interface for Windows or the OpenDoc specification being created by IBM and Apple Computer, Inc. SQL links will be used to link these suites to various corpo-

rate databases.

"What we'll be offering is a standard platform with tools that can be used to build vertical applications," said Jack Armstrong, director of marketing for SmartSuite. However, Armstrong noted that most IS shops will not see these trends start to take shape until vendors have full-blown object implementations around the end of 1994.

Even Microsoft, which is shipping OLE 2.0 support in Microsoft Office 4.0, has not yet fully implemented the OLE 2.0 specification in terms of an automation facility that will make it easy for applications to share objects.

However, once these technologies are deployed, IS managers can expect to spend a lot of time monitoring how they are used. While it may be practical for some end users to build an application for themselves or maybe even their department, the need to maintain quality control in going to require IS managers to maintain strict standards.

Support issues

"A herd of end-user systems creates problems in terms of support," noted Glenn Clada, a systems manager at National Canadian Railways in Montreal.

At the same time, however, many end users are already building vertical applications on top of PC software, and they cannot wait for IS to build every application they need.

"As an end user, who builds applications on top of suites, getting these tools will be fantastic," said Stacy Myers, senior analyst at the South Florida Water Management Project in West Palm Beach, Fla.

for mediocre ones. This is just the beginning. Remember the DEC Rainbow? Kaypro? Osborne? The VIC-20? That's where we are with all these emerging technologies. We need to invest wisely.

9. And finally, our federal government (now I am starting to sound like Mr. Limbaugh) needs to require ratings for all electronic entertainment and then require major electronic and computer vendors to provide full-aids lockers on hardware devices. Don't want your kids seeking R-rated violence? Just look them out.

10. Save us from geographical interfaces, which will become widely seen in the first quarter of this year from General Magic and Apple. These are GUIs which replace traditional icons with icons of desktops, city streets, shopping malls or, presumably, your dresser — and graphically represent on your computer screen. The designers fail to notice that computers are none of these things. Computers are computers.

Coursey is editor of "P.C. Letter," a San Mateo, Calif., industry newsletter. His MCI Mail address is 308-4400.

FORECAST '94: Desktop Computing

Apple PowerPC takes on Intel

CONTINUED FROM PAGE 85

sells for half the price of the Pentium (approximately \$450 vs. \$900). Both Apple and IBM said they will be able to sell PowerPC computers at prices less than those of Pentium-based systems, in effect offering more power for less money.

The big question is whether companies that now use Intel machines will see an advantage in moving to PowerPC as quickly as possible. It seems likely that a reinvigorated Macintosh based on the PowerPC may at least stop current Macintosh customers from defecting to Windows.

"Whenever Apple gives you more bang for the buck, it knocks off another argu-

ment against the Mac," said Tim Yancy, a unit manager at Southern California Edison Co.

Intel officials such as Hans Geyer, vice president of Intel's microprocessor products group, dismiss the speed claims of PowerPC and say the real battle will be fought in the software market. "End users don't buy a chip; they buy

the software," he said. "If Apple and IBM don't get the volume, they don't get the software, and if they don't get the software, who knows what happens to Apple."

Geyer said Intel's next-generation P6 and P7 are on schedule and should be available at the same time as the PowerPC 603 and 604 — late 1994 and early 1995.

Last summer, Intel President Andy Grove said that Intel sees the move to PowerPC as a prime chance to gain Macintosh users who are nervous about a smooth architecture transition.

"They have an architecture choice ahead of them, and they may be interested in other choices," Grove said. "I think we have an opportunity to gain some converts."

The PowerPC sells for half the price of the Pentium.

Operating systems

CONTINUED FROM PAGE 85

Despite these drawbacks, in the past three or four months corporate users started believing in IBM's vision for OS/2 2.X and AIX, as well as the well-timed OS/2 for Windows, and began buying the product in much larger numbers.

While OS/2's 4 million installed base pales in comparison to Windows 3.0's 40 million, many think the product has turned an important corner.

One company that may mount a challenge on the desktop in the next year or two is both Microsoft and IBM — or at least keep them honest — is Next.

While the Next operating system requires 12M to 16M bytes of memory and at least 150M bytes of disk storage, knowledgeable users said they are so impressed with its advanced interface design, extensive 32-bit features and integrated tools that they believe it has a chance to grab a fair share of the high-end corporate desktop market in the next one to two years as storage and memory costs fall.



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Bill Jones, MIS, age 38

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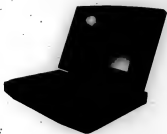


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Forecast '94: Workgroup Computing

Ethernet switching to explode in '94

Hub vendors rush to capitalize on high-speed networking market

By Stephen P. Klett Jr.

1994 is shaping up to be the year of Ethernet switching technology as vendors scramble to come out with products in a market that analysts say is ready for explosive growth.

"The Ethernet switching market is poised for staggering growth in '94. People are just starting to see what switching is all about and are ready to embrace the technology," said Tom Dolores, an analyst at market research firm Datagroup, Inc. in San Jose, Calif.

Switching hubs separate a LAN into smaller segments and then interconnect them at full network speed. This process cuts network traffic by putting fewer users on each segment and giving servers their own network connections.

Datagroup estimated that 1994 Ethernet switching equipment revenue will be in excess of \$140 million, compared with roughly \$60 million in 1993.

In addition to increased user awareness, Dolores pointed to the emergence of bandwidth-hungry applications such as multimedia, full-motion video and audio as switching's primary growth facilitators.

Vendors, meanwhile, are rushing to capitalize on the increased demand. Major hub vendors such as SynOptics Communications, Inc., Cabotronics Systems, Inc. and Chipcom Corp. are expected to jump into the intelligent Ethernet switching hub market this year, according to analysts.

Small firms in the lead

Ironically, these hub leaders will be following in the footsteps of smaller rivals Standard Microsystems Corp., Grand Junction Networks, Inc. and Synergetics, Inc., which have already started shipping intelligent hubs that switch between customers' existing 10M b/sec. Ethernet LANs and emerging higher-speed technologies such as Fiber Distributed Data Interface (FDDI), "fast" (100M b/sec.) Ethernet and Asynchronous Transfer Mode (ATM).

Industry observers said FDDI, ATM and "fast" Ethernet have not yet evolved enough for users to consider them as alternatives to conventional Ethernet LANs. Instead, buy-

ers are looking at ways to merge the technologies through switching.

"1994 will definitely be a hot year for switching. However, vendors who put all their eggs in the proverbial basket are going to be disappointed," said Kathryn Korostoff, president of market research firm Sage Network Research, Inc. in Newton, Mass. "Vendors that succeed will be those that support multiple technologies in their hubs because users are interested in evaluating more than one high-speed technology," Korostoff said (see chart).

Users can expect to see a high-end Ethernet hub with TCP/IP routing capabilities and an ATM interface from Standard Microsystems by fall, said Dave Swickard, director of business development at the Hauppauge, N.Y., company. "We believe this will be a trend, and you'll start to see switching hubs that rival high-end routers from companies such as Wellfleet Communications, Inc. in performance," he said.

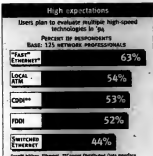
Switching hub switch

Synergetics, which is being acquired by 3Com Corp. (CW, Dec. 20), said it plans to develop an ATM interface for its LANplex 5000 family of switching hubs, although the company declined to give specifics. Synergetics, based in North Billerica, Mass., recently released the LANplex 6004 hub, which incorporates switched Ethernet connections, internetwork routing capabilities and an FDDI server connection.

3Com, which resells Synergetics' LANplex 5000 hubs as its LinkBuilder 3GH family, said it will not change Synergetics' development plans.

While most hub vendors offer segment switching capabilities, Grand Junction takes a different route with its Fast-Switch 19100, which provides 25 dedicated 10M b/sec. Ethernet connections to individual desktops and two 100M b/sec. server connections.

"We see a bright future in Ethernet switching and providing connectivity to bigger pipes," said Jack Moss, vice president of marketing at Grand Junction in Fremont, Calif. "My forecast is that [it] is just to see more and more 'fast' Ethernet products over the next year."



*Source: Sage Network Research, Inc., Newton, Mass.



A workgroup world in '94

OPINION BY JOHN DONOVAN

Workgroup computing generates a lot of interest from users and vendors alike. Unfortunately, it has only delivered a few hundred pounds of real progress.

Why the shortfall? Too many people have the idea of workgroup computing turned around. They approach it from the "computing" end. It's time we all recognize that this is wrong—that work-

group computing actually has a much greater impact on an organization's social and business systems than on its information systems.

Properly applied, workgroup computing improves delivery.

competitive advantage. Poorly applied, it can be a career killer and inflict damage on the organization.

I've come up with some New Year's res-

olutions about how I'm going to evaluate workgroup products and strategies from now on. Maybe you can also use them to ensure you're getting the full value of workgroup computing from your investment.

► A vendor must convince me that it understands how groups and business systems function before I'll listen to it.

This isn't just jumped-up shrink-wrapped personal productivity stuff anymore. Show me your group or business workflow or experience before you show your product. No credentials, no demo.

► No paradigm shifts.

The users in my company never mob my office begging for new paradigms. They say they want tools that work the

way people work.

► Vendors must position products in the context of particular requirements and set reasonable expectations. Workgroup computing runs the gamut from two individuals to enterprise-wide networks. If I'm trying to provide better workflow in a small department, please address my needs at that level. Then let me understand what business benefits I can expect.

► I'm going to demand the names of five other users, at least three of which must have applications comparable to mine.

Workgroup products are unusually sensitive to the application, so the best test is to talk to people who are in boats.

Donovan, page 75

Client/server offerings expand

By Kim S. Nash

Long dominated by human resource packages, the off-the-shelf client/server applications arena will become a proving ground for financial and accounting products in 1994. Offerings from archivalists PeopleSoft, Inc. and Dun & Bradstreet Software will have been out for several months, giving users a chance to test the products in real life situations.

Vendors are expected to fill in holes in product lines by adding miscellaneous accounting modules or porting products to various Unix relational databases not already supported, for example.

Smaller companies such as Platinum Software Corp., DMR, Inc. and Integral Systems, Inc., to name a few, will pour on the competition, trying to differentiate their products by adding imaging, document management and workflow features.

Distinguishing characteristics

Platinum, for example, points to its imaging capabilities as a distinguishing feature in its products. D&B Software has built its own workflow technology into its Financial Stream products. PeopleSoft plans to take a more generic route, building links between its products and Lotus Development Corp.'s Notes and Reach Software, Inc.'s workgroup software.

"Options are opening up quite a bit, which is good for any market," said Bill Reiter, vice president of central systems at Baxter International.

But what is missing from the client/server market, by and large, are choices for manufacturing applications. Avalon Software, Inc. stands out in that sector with its CRM family, a set of integrated manufacturing and financial systems. PeopleSoft plans to test the waters in the distribution and materials management arena with client/server packages due out in late 1994. The company has said it is interested in manufacturing but is not likely to build such applications itself.

NT will find enterprise server niche

By Mark Halper

The multiuser hardware business is one of those industry segments where the crystal ball always portends ever faster and cheaper systems. And while that vision will still apply in 1994, a few other changes are in store.

Perhaps most notably, Microsoft Corp.'s Windows NT operating system will make some inroads.

Although no one expects a herdlike movement to an unproven operating system on the minicomputer enterprise level, users see some departmental possibilities.

Sequent Computer Systems, Inc. got the ball rolling by introducing a line of NT servers early this year, and Digital Equipment Corp. has endorsed NT through its Alpha-based boxes.

Hewlett-Packard Co. is scheduled to introduce in January low-end minicomputers based on a reworked version of the PA-RISC chip that eases the NT porting task.

While users are not clamoring for NT on their HP multiuser systems, few say it is a bad idea.

"I could put HP boxes down on the server level and not have to go out and buy a Pentium," said Jerry Kopecky, manager of MIS operations at IVI Travel, Inc., a Northbrook, Ill. HP 3000 and 8000 shop.

Reliability rules

As NT starts to carve out a place in the enterprise world, multiuser vendors will continue to promote their Unix and proprietary systems for data center work. And as they do so, users will continue to look for more management tools that enhance reliability.

Sam Ellis, associate vice president of information services at Portland Community College in Portland, Ore., for instance, said he hopes to see vendors develop remote procedure calls that will facilitate interoperability among computers in distributed schemes.

"People are buying multiple smaller systems and carving chores up among them that they used to do on one mainframe," Ellis said. "The challenge is for someone to be successful in managing all that diversity."

"I'd like to see HP/UX [HP's Unix operating system] become more battle-tested," said John Jaszewski, chief information officer at Barber Colman, Inc., a Rockford, Ill., vendor of environmental and in-

dustrial controls. Topping his Unix wish list: management and security tools plus "product data management" tools that would enable various departments in a manufacturing organization to share information.

Meanwhile, users foresee continued belt-tightening by their suppliers, meaning they expect to see telephone support

increasingly replacing direct sales support.

"I'm predicting that HP direct sales people will disappear unless you're a big customer," Kopecky said.

Other anticipated changes include the emergence of massively parallel processing (MPP) systems from some multiuser vendors. Pyramid Technology Corp.

and IBM are expected this year to join NCR Corp. on the list of vendors furnishing MPP systems to the commercial market.

And of course, users expect continued price/performance improvements in today's uniprocessor and symmetrical multiprocessor systems.

"I'm certainly expecting to see the same kind of performance gains we've enjoyed in past years," Jaszewski said.



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FORECAST '94: Workgroup Computing

Donovan

CONTINUED FROM PAGE 73

similar to your own.

► I'm looking for bulletproof problem-resolution guarantees, not just policies.

If vendors boast "mission-critical" applications, I'll make them back them up with guarantees that recognize that my work is mission critical.

► I won't buy anything that won't support all users equally.

Would you remove the telephones from a random 10% of your company's desks? Why should you consider a workgroup product that can't communicate with your DOS, OS/2, Macintosh, Unix, workstation or terminal users?

What's in store

Those are my resolutions; now, here's my forecast.

Early in 1994, we'll see the first million-user workgroup product in Lotus' Notes. This "overnight" success has been building since 1988. When Notes hits a million users, third-party support will accelerate. Notes will become this market's first true de facto standard in 1994.

A new wave of products will appear that embody the lessons of workgroup computing's early years. The first new hit of 1994 will be an intuitive conferencing package that lets PC users share a

Many IS professionals who excel at providing workgroup computing solutions will end up running their organizations before this decade is over.

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The most significant enterprise-capable workgroup products will be offered by systems vendors. They have the experience necessary in corporate information systems and applications. They also have the support depth and resources that users need when contemplating a significant change in a business process.

Look for Digital, IBM and others to play a growing role in enterprise-capable workgroup solutions.

Threat to Windows

The dominance of Windows will be severely threatened when Taligent ships its operating system this year. I saw Taligent at Comdex, and it showed the most comprehensive implementation of all the claimed benefits of object orientation that I've ever seen. My immediate and enduring impression was: "This is the way computing is supposed to work."

Once last prediction. Workgroup computing means that a growing proportion of your company's business takes place over information systems. Those IS professionals who excel at understanding and applying workgroup computing solutions will become the new heroes of the business community. Many will end up running their organizations before this decade is over.

Donovan is a senior consultant at WorkGroup Technologies, Inc. in Hampton, N.H.

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Forecast '94: Enterprise Networking

Management help en route

OPINION BY MARC DODGE

The news has been the same all year—bad. The cost of supporting and administering LANs, PCs and client/server applications is astronomical. Network management problems threaten to do for distributed computing what the Hare Krishnas have done for airports. But, I've got good news.



Honest, working pieces are coming. Help is on the way. Network management refers to the tools and processes we use to keep computer hardware, software and systems humming. Integrated network management (INM) is the advanced stage of network management.

With INM, we manage the computer universe with an enterprise-wide view instead of managing one piece at a time. INM is how we will stay the client/server highs.

During 1994, aggressive companies will use INM to begin controlling client/server hardware, software and systems costs. This is good news, but the real shocker is that integrated tools will be available for LANs and PCs before they are available for WANs and the host.

How can this be? Distributed computing is the new kid on the block. For starters, WAN vendors are fighting their version of the 100 Years' War.

Dodge, page 30

LAN services extend reach

By Elisabeth Horvitt

All the major network operating system vendors have all promised that 1994 will be a banner year in terms of shiny, technologically breathtaking introductions in the enterprise network services arena.

Some of the more sweeping introductions—Novell, Inc.'s Extended Networks rollout comes to mind—seem more geared to the vendors' long-term profit picture than to users' immediate needs. On the other hand, many of those needs are also being met. For example, next spring Novell will address the needs of companies that want to migrate slowly to NetWare 4.01. It will introduce utilities that will enable NetWare v3.11 systems to access NetWare 4.01's NetWare Directory Services.

Up & coming

Following are other upcoming events, in their approximate order of appearance:

► In early January, Novell is expected to announce its Extended Networking strategy for implementing NetWare-based services in industries and environments that are largely new turf for the vendor, such as the factory floor and fast-food outlets.

► By spring, Novell is expected to put in place many of the pieces of its AppWare Foundation and Visual AppBuilder client application development environment.

The AppWare family was designed to drastically cut the amount of time it takes for third parties to write client-based applications and to make them automatically portable across multiple client systems. This should benefit users, if

only indirectly, because manufacturers will pass their savings on to customers, according to Charles Tilbury, a network analyst at the University of Texas M.D. Anderson Cancer Center.

► In the first half of 1994, Banyan Systems, Inc. is expected to provide graphical user interface front ends for its electronic-mail, directory and management services. Users have complained for some time that administering such services with the current front end is difficult and time-consuming.

► Banyan is also expected in the first half of the year to ship services that automatically back up data on its networks and manage the distribution and collection of data across multiple locations on the network.

WHAT YOU'LL GET	
USER NEEDS TO BE MET BY 1994:	USER NEEDS TO BE MET AFTER 1994:
<ul style="list-style-type: none">Integration of enterprise services into a single global directory.Multivendor client and server systems management.Broader choice of platforms for enterprise services.Easier migration from NetWare 3.11 to 4.01 (Novell only).	<ul style="list-style-type: none">Standardized interoperability across different environments.Standardized security across different platforms.Standardized mail, directory and messaging across different platforms.

Loosing patience

While admitting that such services are potentially valuable, both Novell and Banyan customers are growing impatient for the vendors to provide full-function versions of their network services on more powerful server platforms, analyst and user sources said.

With many companies' server installations and budgets hard-pressed to keep up with present network service and user demands, the last thing companies want to think about is implementing a new set of CPU-hungry services, such as

LAN services, page 30

Wide-area services

Broadband and wireless top WAN agenda

By Joanie M. Wedder

Major progress in the expansion of broadband and wireless networking infrastructures is on the agenda for 1994, reflecting corporate America's continuing topon toward the "virtual office" and "global village."

Deployment of the international-standard Synchronous Optical Network in both the local loop and interexchange networks will pave the way for the delivery of Asynchronous Transfer Mode (ATM), now little more than a buzzword, frame relay and other high-speed networks supporting bandwidth-heavy applications such as disaster recovery.

"There are pent-up applications" in corporate America requiring broadband networks, said Daniel Briere, president of TeleChoice, Inc., a telecommunications consulting and research firm in Verona, N.J.

"People are ready to do things but have been waiting on the economy to be able to afford the equipment," Briere said. "By the year 2000, when the carriers will catch up to user applications with their infrastructure endeavors."

Defining ATM

MCI Communications Corp. will launch its ATM service, for example. Other carriers will better define ATM applications by helping customers with end-to-end ATM setups that go beyond networking gear to medical, imaging or other involved equipment on their premises, Briere predicted.

These activities will in large part result from the continued efforts of the ATM Forum, the unofficial body that has been working toward interoperability specifications for the emerging technology.

On deck for the forum in 1994 is easing

down standards for signaling, traffic management, LAN emulation over wide-area networks and the interconnection of dissimilar networks such as frame relay and Switched Multimegabit Data Service with ATM networks, according to Irfan Ali, the forum's marketing vice president.

He said that 1994 "should be a key year for 'real' ATM," as much of the forum's efforts this year should translate into equipment in both carrier and end-user networks.

On the wireless side, Rob Rich, director of public networks at San Jose, Calif.-based consultancy Dataquest, Inc., said 1994 will be a "banner year" for wireless technology, with the rollout of Cellular Digital Packet Data (CDPD) networks and an expected surge in the availability of mobile hardware and software platforms.

McCaw Cellular Communications, Inc.

said that its CDPD infrastructure should be pretty well in place by June, and Rich predicted that Mobilink, a consortium of cellular vendors that includes the regional Bell operating companies (RBOCs) and GTE Mobiltel, will follow suit with a fairly fleshed-out infrastructure by year's end.

PCS hatches

In addition, the federal auction for Personal Communications System (PCS) wireless spectrum is slated for May. Though analysis predicted mostly PCS trials in major metropolitan areas in 1994 as opposed to major rollouts.

Integrated Services Digital Network will finally enjoy impressive growth, possibly doubling in use, Rich said, as satellite offices and remote users proliferate.

Also, the leveraged partnering of RBOCs with cable TV companies "should settle down, and we'll see a better definition of the strategies," Briere said.

Rich predicted innovative uses next year of the cable TV network, such as access to the global research and academic Internet.

Frustrating year ahead for messaging management

By Lynda Radosevich

In 1994, end users will begin tapping into some of messaging's more sophisticated features, such as work-flow applications and remote access. However, 1994 will be a "year of frustration" for managers charged with creating a stable network infrastructure and directory services (often on limited budgets) that can support the end users without the benefits of big iron, according to users and analysts.

On one hand, end users will have more goods. Calendaring and scheduling, remote access, mail-enabled work-flow applications, wireless messaging and enterprise-wide faxing are some of the services that managers said they will begin providing to their users in 1994.

For instance, "if someone leaves the office for a week, they'll be able to forward their E-mail to someone else and have just the mail that they want sent to them remotely," said Kevin Ryan, director of electronic-mail service at Aetna Life & Casualty, Inc. in Hartford, Conn.

Simultaneously, mainframe shops "will stampede off the mainframe," according to Patricia B. Seybold, president of the Patricia Seybold Group in Boston.

"Most large companies have had their E-mail task forces operating for 12 to 18 months, and they are ready to go," she said.

Tool development slow

But some of the tools needed to create stability in the LAN messaging world will still not be fully developed or widely available.

For instance, users and analysts anticipate that vendors will roll out management tools and improved X.500 directories in 1994, but that those products are not expected to mature and spread until 1995.

"Messaging management is an absolutely critical piece, but I expect vendors will still be playing catch-up," said Don W. Price, a technologist at Texaco, Inc. in Tulsa, Okla.

In order to help simplify enterprise management, many large customers will consolidate to two or three E-mail sys-

tems, rather than support the half-dozen or more that they do now, said Walter Ulrich, a director at Arthur D. Little, Inc.'s Los Angeles office.

"We're trying to cut down," agreed Roger K. Mizumori, a manager of messaging services planning at The Boeing Co. in Seattle.

Plans by LAN market leaders Lotus Development Corp. and Microsoft Corp. to incorporate X.400 transports are ex-

pected to help the consolidation process "as long as the products can interoperate," Mizumori said.

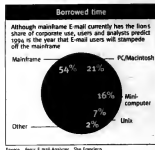
Year of planning

For users in LAN systems, 1994 will be a year of planning for changes as Lotus and Microsoft move their products from file-based to client/server architectures. "That will require a lot of reconfiguration in terms of directories, administra-

tive tools and management processes," said David Whitten, program director at the Gartner Group, Inc. in Stamford, Conn.

Meanwhile, Microsoft's intentions to ship a free messaging client with Windows 4.0 will require all vendors to rethink their pricing strategies. And users will have to decide whether the free client makes it worthwhile for them to buy into Microsoft's Windows-centric strategy.

"Putting this all together will be hard," noted David Marshak, a vice president at the Seybold Group.



LAN services

CONTINUED FROM PAGE 79

Novell's upcoming multimedia service offering, said Glenn Fused, president of the Boston Area Novell Users Group.

Banyan and Novell claim to be addressing this problem by moving their respective server platforms to RISC-UNIX systems. However, both efforts are said to be moving more slowly than the vendors originally promised, or users would like to see.

► Microsoft Corp. and Novell will be going head-to-head in the global E-mail services market this year. Microsoft will enter that market for the first time with the announcement of its Enterprise Messaging Server, Microsoft spokesmen said (CW, Nov. 8). Novell will make the first stab at integrating its Global Messaging Handling Service with its NetWare Directory Services (CW, Dec. 8).

The moves could potentially provide users with the network operating system industry's first industrial-strength enterprise E-mail services outside of Banyan's StreetTalk. Less clear is how soon users will be able to exchange E-mail across different vendors' E-mail platforms via the X.500 standard. All three vendors claim to be providing some level of X.500 compliance, but interoperability may be a year or two away.

Get the ratings

Sixty-nine information systems managers, recently surveyed by the Computerworld Database Division, rated network system management as a 4.4 (on a scale of 1 to 5) as the service they would most like to see provided across multiple client/server platforms. Active second was security and/or user access administration (4.3), then software distribution (4.0).

Dodge

CONTINUED FROM PAGE 79

War. They are battling over Unix flavors, RISC workstations, network management platforms and who is really "open." This is a professional drive worthy of any Congressional session.

Microsoft, Novell, Lotus et al. have knucklehead moments, but compared with the WAN and host folks, they are much more pragmatic. In network fighting, they put together the Distributed Management Task Force's NetWare Management System (NMS) and Microsoft's Hermes. These industry and company-specific initiatives are doing something eerie. They are producing product. This is in sharp contrast to the sick man of network management platforms—the OSF's Distributed Management Environment.

NMS includes management features for network monitoring, administration, inventory control and remote access. Next year, it will be possible to use NMS to proactively monitor remote LANs and PCs from a central help desk.

Even HP and IBM are moving their industry-leading INM platforms toward client/server solutions. HP will port OpenView to Microsoft's Windows NT. Users will be able to mix and match NT with Unix network management workstations. IBM will port NetView/6000 to NT. And both vendors are holding PC-specific solutions onto what were once big iron-only platforms.

The benchmark for INM success is third-party support.

Novendor can do it alone. There are too many devices to support. Third-party vendors are delivering solid products that will run on multiple management platforms. Two winners are Intel's LANDesk and Frye Computer Systems, Inc.'s Frye Utilities.

First in line

There are other reasons that IBM will come to LANs before WANs. For one, the need is not as pressing in the WAN world. WANs include modems, multiplexers, switches and routers. These tend to be stable and have dependable network management built in. LAN element managers are not integrated, but this is offset by unstable deployment and longer times between failures.

And consider the cost/benefit analysis. Getting bucks for corporate network management is a pain in the butt. Put the numbers on paper. The LAN piece is easier to justify than the WAN piece. Why? Because more support people and end users tend LAN/PC boilers.

Fewer people support the WAN. So, the rate of return for WAN-integrated network management is less than it is for the LAN/PC version. As far vendors, they realize that client/server (and cash-register wails) won't happen without INM. That is the main reason they are working together.

So, take heart. By this time next year, leading-edge users will show that INM is real. We will begin cost-cutting client/server costs, and LAN and PC vendors will lead the way.

Dodge is telecommunications department manager at S Fortuna 100 company.

Briefs

Iowa net chooses Wellfleet

Iowa Network Services, Inc. plans to install Wellfleet Communications, Inc. routers in its 1,300-mile fiber-optic network, which provides long-distance services to independent phone companies in the state. The goal is to deliver voice,

data and Internet connectivity to Iowa businesses, schools and other organizations via leased-line or dial-up links.

Motorola denies tumors

In an attempt to stamp out fears that cellular phones can cause cancerous tumors, Motorola, Inc. issued a press statement that an employee's recent lawsuit is groundless. Various studies have found Motorola

employees to be healthy and less cancerous than the average U.S. citizen.

Messaging hub gets client

Control Data Systems said it will ship in January standards-based end-user software for use with its X.400 messaging and X.500 directory hub. Control Data licensed the software from Enterprise Solutions Ltd.

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Esther Dyson
Founder

President, Edventure Holdings, Inc. Editor and publisher of the influential newsletters Release 1.0 and Web-EAST. Release 1.0, wide-

ly respected and quoted for over 10 years, focuses on new developments in software and software design, applications, networking and the transforming of new technologies into commercial solutions. Dyson promises a frank and forthright review of the client/server uprising.



David M. Carlson
Senior Vice President, Corporate IS, Kmart Corporation, International Headquarters.

Carlson has been noted for creating a vision for automation and technology. The company's retail automation program saves Kmart approximately \$200 million annually through UPC symbol scanning, on-line credit authority and automated lay-aways. Carlson's work has been recognized in awards by SIM and Computerworld.



L. John Saverian
Senior Vice President, IT, at The Trane Company. As VP, IT and Change Agent, he initiated and has provided leadership for a massive re-eng-

neering effort, called Business Transformation. He is responsible for the design and construction of the client/server infrastructure which will enable and support transformed business processes. He has provided IT leadership, pioneering in such areas as end-user computing, telecommunications and outsourcing.



Roy W. Comblin
Senior Vice President and CIO for Oracle Corporation.

where he managed technological and operational support for more than \$20 billion of business transactions daily. In 1989, he received "Information Systems Visionary Award" for his work in client/server technology.

information systems and support services. Prior to joining Oracle, Comblin worked at Wells Fargo where he managed technological and operational support for more than \$20 billion of business transactions daily. In 1989, he received "Information Systems Visionary Award" for his work in client/server technology.

32 Bit Operating Systems & Apps



John Gantz
Senior Vice President, International Data Corp.

At IDC, Gantz oversees research in desktop automation and work group and office computing. His coverage also includes PC hardware, software, and pricing, as well as open systems, PC channel support, and LAN-based computing. Gantz brings 20 years of research authority and can do a closer look at how 32-bit technology will perform in the trenches.

Manager, Information Delivery Technology, Royal Bank of Canada. Other has spearheaded the Royal Bank's



Georgia Oliver
Manager, Information Delivery Technology, Royal Bank of Canada.

Other has spearheaded the Royal Bank's

information Delivery Technology Group which oversees PC, LAN, Security, Self Service and Office Technology products. With this group as the technology catalyst, the Royal Bank has evolved in a delivery system from a central-site computing focus into a distributed cooperative enterprise of mainframes, LANs and PCs.



David A. Pensak
Principal Consultant in Advanced Computer Technology to E.I. DuPont de Nemours, Inc.

As Corporate Advisor, he has

had responsibility for planning and managing projects in computer science and technology. He has chaired or served on corporate committees on Open Systems, Data Security, Workstation Selection, Software Auditing, Technology Planning Expert Systems and Electronic Conferencing.

Imaging/Work Flow Technology



Charles Babcock
Technical Editor, Computerworld.

Babcock reports on the pivotal technologies that are shaping IS in the '90s. In addition to extensive coverage of

user and vendor sites, he writes a weekly column on major technology trends and directions. Babcock has served as mid-Atlantic news correspondent, senior software editor and assistant news editor. Working out of the West Coast News Bureau, he brings an astute perspective to the assessment of imaging/work flow technology.



Ronald L. Baker
Vice President, IS Architecture, Planning and Operations, Connecticut Mutual Life Insurance.

In the past five years, he has held executive manage-

ment responsibility for corporate level technology services, including information architecture, corporate business applications, mainframe computing, database services, network services, PCs and client/server computing. He has played a leading role in deploying image workstations and client/server technology



Michael R. Owens
Corporate Administrator for the State of Delaware.

He is responsible for direction and supervision of all day-to-day operations of the Delaware Division

of Corporations, including administration of a \$4.7 million budget. Delaware is home to over 214,000 corporations, including over 50% of the Fortune 500. When completed, the Open Image project will allow images to be remotely scanned and transferred right into the work flow, processed, and re-tri-ved to the originating law firm.

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Make-or-Break Decisions Solution Labs



Dale Katsik
META Group

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Dale Katsik is president, research director and founder of the META Group.



Leo Collins
PacificCare Health Systems



David T. Aldridge
BaseOne Diversified Services Corp.

The CTO Perspective

Two CTOs take the challenge: to tell you what their companies have concluded about these three critical technologies. They share their methods, their experiences and their own technology plans.

Leo Collins is director of Applied Technology and Information Architecture for PacificCare Health Systems. David T. Aldridge is vice president and chief technology officer for BaseOne Diversified Services Corp., a \$76 billion corporation in banking and finance.



Catherine Loop
The Research Board

The Uncharted Territory

An exclusive look into the top forecasts and analyses from The Research Board.

Catherine Loop, is partner and vice president of research at The Research Board, which convenes its 90 members to debate findings and to benchmark their experiences and best practices as CIO's of some of the country's most important businesses.

Loop will conclude the Summit with a look into the future of each of these three technologies. Will the other technology trends surpass, supersede or sidestep client/server, 32-bit systems and imaging/work flow? Will these technologies evolve — or converge — in predictable or non-predictable ways?

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Forecast '94: Large Systems

Users to Digital: Solve sales shortcomings

By Craig Stedman

Digital Equipment Corp. plans to open 1994 with a revamp of its low-end Alpha AXP workstations and finish off the year by introducing T2-processor data center systems. But Digital's attempt to overhaul its sales and marketing operations is expected to hold the key to how well the intervening months go.

Digital continues to catch flak despite recent efforts to upgrade its sales and marketing forces. Users complain about Digital's lack of a coherent long-term strategy, thin technical sales support staffing and salespeople who cannot explain the company's products and are still oriented more toward OpenVMS than Unix.

Lead and clear

The need to improve in those areas or risk losing customers was the dominant message for Digital executives at the Digital Equipment Computer Users Society (DECUS) fall conference in San Francisco in December.

"It's not because we like competitive vendors' products better. It's because we can deal with competitive vendors, and many of us can no longer deal with Digital. And that's a sad situation," said Kevin Oberman, a network manager at the Lawrence Livermore National Laboratory in Livermore, Calif., during a DECUS session with a panel of Digital vice presidents.

Digital is not doing a good job of preparing its sales force, said a senior Alpha VAX site in the aerospace industry, who asked not to be identified. "A lot of times the customer knows more about the product offering than the salesmen," he said. "You feel bad for them."

Digital is retraining all sales employees and has centralized product marketing in hopes of

presenting a more cohesive front, but Edward Lacoste, vice president of worldwide sales and marketing, offered no quick-fix promises at the DECUS meeting. "I guess it's just a case of your patience," he told users.

Due to lingering sales and marketing shortcomings and the likelihood that Alpha shipments will not reach heavy volume until the second half of the year, 1994 is expected to be "a dig in and hang on kind of year" for Digital, said Lynn Berg, an analyst at Gartner Group, Inc., a consulting firm in Stamford, Conn.

"The products themselves are sound," Berg said. "It's a question of getting market visibility to them and generating some demand."

Other analysts and users noted that Digital's ability to drive Alpha beyond its installed base could be affected by the advent of the PowerPC architecture developed by IBM, Apple Computer, Inc. and Motorola, Inc. At Comdex/Fall '93, "everybody was talking about PowerPC," said Frank D'Amico, president of Communications Network Architects, Inc. in Washington.

William Demmer, vice president of Dig-

Revenue remedy

Digital executives are counting on the DEC OS/5 operating system to provide most of the company's revenue growth during 1994.

Alpha additions

Digital's 1994 rollout schedule for the Alpha AXP line includes the following:

► **RISC PCs:** A low-profile desktop system based on the DECchip 21066 microprocessor and Peripheral Component Interconnect (PCI) bus is due out in the first half of the year. It will run Microsoft Corp.'s Windows NT plus OpenVMS and DEC OS/5, and pricing is expected to start at about \$5,000. Also planned for the first half is a 21066-based version of the DECpc XL desktop machine.

► **Workstations:** Clock-speed upgrades for the low-end DEC 3000 Model 300L and 300 workstations are scheduled for January or February; the new models will offer a 10% performance boost with prices similar to the existing machines. In the second half of 1994, Digital will field a high-end desktop

tal computer systems group, acknowledged the company has "an image problem" that it needs to overcome in order to compete against the PowerPC vendors.

Digital is planning a series of Alpha hardware introductions during 1994 to round out the product line (see story below). OpenVMS for Alpha will reach functional parity with the VAX version when a new release ships in the spring, company officials said, and the DEC OS/5 operating system is scheduled to gain support for symmetric multiprocessing by July.

model based on a second-generation Alpha chip and incorporating the PCI bus rather than the Turbochannel interconnect.

► **Low-end servers:** Digital plans to enter the superserver market in the spring with a four-processor system, code-named Sabote, that will use the PCI bus and support 256 bytes of memory and 18 hard-platter disk drives. Pricing is expected to start in the \$25,000 to \$30,000 range, and a half-size version is in the works. Follow-ons to the low-end DEC 2000 Model 300 and 300 systems are due in the second half of the year.

► **High-end servers:** Versions of the DEC 7000 and 10000 data center systems with the second-generation Alpha device and support for T2 processors, up from the current limit of six, are scheduled for late 1994. PCI support will also be added, although Digital executives said the machines will have a mix-and-match capability that allows continued use of their existing buses.

Class confusion

OPINION BY TED PRINCE

SOMEONE WILL BE THE YEAR OF THE SMALL system? I don't think so. For all of client/server's aces appeal, 1994 will be the year of the large system. Except that we will not spoil the effect by calling them mainframes. How about something more alluring... like virtual reality servers (OLTV, of course)?



Why do I think the large engines will be staging a comeback? A couple of reasons. First, radical modularizing and parallelizing of large systems will tend to equalize radical cost reductions. And, as costs come down, so will the

Prince, page 88

CA's mainframe revenue keeps growing and ...

By Thomas Hoffman

For Computer Associates International, Inc., 1993 will likely be remembered for the software giant's big splashes in distributed and client/server-based systems management tools, particularly its intention to deliver CA-UniCenter for approximately a dozen distributed platforms.

But CA has been shipping the systems management packages since Jan. on Hewlett-Packard Co.'s HP 9000 Unix-based machines only, and UniCenter will probably bring the vendor less than \$100 million in revenue by the end of the company's fiscal year in March, analysts said (see chart).

Still, CA's Unisenter revenue—at least for the near term—will not make or break the vendor. The \$1.5 billion Islandia, N.Y., software firm continues to derive nearly 80% of its revenue from mainframe software sales. That trend is expected to continue

through 1994, according to analysts.

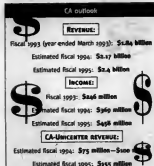
In fact, CA amazed analysts with its estimated 30% growth in mainframe software revenue during 1993 in the

face of an otherwise shrinking market. Most CA winners, including Stephen T. McCall, a first vice president at Merrill Lynch Global Securities in San Francisco and Charles E. Phillips at Kidder, Peabody & Co. in New York, project CA will achieve similar growth in 1994.

The analysts are optimistic because CA has patched up hundreds of once-strained customer relationships, not to mention signed dozens of large customer contracts to three- to five-year enterprise licensing agreements, including Citicorp, N.A. and the U.S. Postal Service.

"CA is tactically astute because they're locking in those customers for another three to five years while giving themselves more time to trans-

CA, page 88



Sources: Merrill Lynch Global Securities; Kidder, Peabody & Co.; Cowen & Co.

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THE ASK GROUP

DBMS makers hold the keys

By Kim S. Nwab

As a central piece of the client/server puzzle, database makers are in a position to help steer how quickly—and how well—such architectures roll out. Users should watch for several key trends in 1994.

Two camps are staking out ground at the departmental database level, namely Sybase, Inc. and Microsoft Corp. vs. Oracle Corp. and Novell, Inc. While Microsoft introduced an aggressively priced SQL Server for Windows NT database, Oracle made plans to ship a workgroup-oriented database bundled with Novell's NetWare and UnixWare. Like Microsoft SQL Server, the bundle—dubbed OracleWare—ships through resellers.

As the two factions fight for departmental-level client/server users, Unix database pricing is likely to fall, analysts said. "Oracle is at a disadvantage if it can't offer comparably priced products," said John Morrell, an analyst at International Data Corp. (IDC). He noted that information systems shops doing client/server in a workgroup setting are likely to think twice about Oracle's historically high prices when Microsoft offers an unlimited-user license for SQL Server for about \$13,000.

Parallel processing hot

At the high end, parallel processing capabilities are a hot topic among Fortune 500 users looking to put massive, mission-critical applications on either symmetric multiprocessing (SMP) or massively parallel processing (MPP) machines. Bleeding-edge firms that piloted MPP systems in 1993 should be ready to go live during the next year, for example, American Express Co. and American Airlines, said Richard Winter, principal at Winter Corp., a consulting firm in Cambridge, Mass.

"But the masses are by no means ready to implement MPP databases," he added, explaining that the technol-

phases during 1994 and 1995 (see story below).

In 1994, CA will ship its systems management package for varied distributed platforms, including Sun Microsystems Inc.'s Solaris, IBM's OS/2 and AIX, Sequent Computer Systems, Inc.'s Symmetry, Novell Inc.'s NetWare, as well as Pyramid Technology Corp.'s MIS servers, Data General Corp.'s

CA

CONTINUED FROM PAGE 55

ation to client/server," McClellan said.

Phillips cautioned that CA's mainframe revenue growth will likely ebb in the next few years as its installed base continues to move away from big iron to distributed systems.

While IBM's System/390 mainframe sales continue to shrink, CA is readying its systems management and database products for IBM's forthcoming System/390 parallel architecture. Those include the CA-TOP Secret and CA-ACF2 security packages as well as the CA-1, CA-7, CA-11 and CA-Scheduler products, according to Mark Combs, a senior vice president of research and development at CA.

Combs declined to say when CA's systems management products would reach the IBM parallel market, but Fredrick Diadarovic, a CA vice president of R&D, disclosed that CA would release its IDMS and Database products for the parallel environment in

CA's client/server steps

CA is readying several PC-based client/server-oriented graphical user interface (GUI) business applications for introduction in 1994. These include the CA-Masterpiece accounting package, CA-FRM, a manufacturing package; CA-HRISMA, a human resources system; and CA-Warehouse BOSS, a warehousing and logistics product. All will be configured for Windows front ends and Unix servers, according to Marc Sokol, CA's vice president of product strategy. Furthermore, CA will update HP/UX versions of its IDMS and Database packages this year, with CA-Databases for HP/UX becoming available in the first quarter of 1994, according to Fredrick Diadarovic, a CA vice president of research and development.

In addition to its application development products, CA will unveil CA-Vision and CA-Resilia. These will be designed for programmers to leverage Cobol code in legacy applications and write GUI client/server applications, Sokol said. —Thomas Hoffman

Shifting tide

DBMS sales for IBM and compatible mainframes are still the market leaders, but Unix DBMS sales will take over in 1995

	1993	1992	1991	1990	1989	1988
IBM PC compatible	\$453	\$453	\$592	\$592	\$592	\$592
Other mainframes	\$592	\$592	\$592	\$592	\$592	\$592
DEC VAX	\$592	\$592	\$592	\$592	\$592	\$592
Other mainframes	\$592	\$592	\$592	\$592	\$592	\$592
AS/400	\$592	\$592	\$592	\$592	\$592	\$592
IBM PC compatible	\$592	\$592	\$592	\$592	\$592	\$592
Microsoft	\$592	\$592	\$592	\$592	\$592	\$592
Other PCs	\$592	\$592	\$592	\$592	\$592	\$592
Total	\$592	\$592	\$592	\$592	\$592	\$592

*Estimated. Figures are database license revenue and do not include sales at maintenance level.
Source: International Data Corp. (Frankfurt, N.J.) and Software Publishers, Inc. (New York)

ogy is too new and expensive for mainstream IS managers to plunge into.

Nevertheless, relational database market leader Oracle has promised to add MPP functions to Oracle 7.1, due out in early 1994. Parallel query optimization and on-line backup are likely features. Sybase and Informatica, Inc. are focusing on SMP, teaming with NCR Corp. and Sequent Computer Systems, Inc., respectively. Both Sybase and Informatica are due to ship parallel processing products about the same time as Oracle.

The ASK Group, Inc.'s Ingres division has not made any announcements regarding parallel processing, but a spokeswoman said it is heading toward SMP in 1994. Object-oriented databases will face a make-or-buy year, according to analysts. IDC predicts that worldwide sales of the products will just about double in 1994 to \$125 million from an estimated \$64 million in 1993.

Avion and IBM's AS/400 platforms, said Marc Sokol, CA's vice president of product strategy.

High-level capabilities

Both HP and NCR Corp., with their respective OpenView and StarSentry distributed systems management packages, are working on high-level management capabilities, while Novell is working to link software distribution functions with the network management capabilities inherent in NetWare, said Jonathan Enkin, research director at Illuminata, a Hollis, N.H., systems software technology assessment firm.

Andrew C. Brousseau, a director at Boston-based Cowen & Co., predicted CA would finish fiscal 1994 with \$100 million in Unicaire revenue and that the package would bring in \$155 million in sales in 1995.

That is quite a projected sales jump for Unicaire considering that CA has thus far tallied just \$26 million—or 32.9% of its total midrange revenue in the past two quarters—through CA-Unicaire for HP/UX sales, Brousseau said.

That is a pittance compared with the \$2 billion market for relational databases, but the technology will expand beyond scientific systems to more business-style applications, said Steve McCure, an IDC analyst.

Stimulating growth

Meanwhile, relational firms will try to preempt growth in the object-oriented database market by adding their own object capabilities to existing systems. Oracle 8, which Oracle insiders say will be announced by the end of 1994, is expected to contain some object features, such as the ability to do queries on unstructured data. However, the product is not likely to ship until well into 1995, according to sources.

Sybase will have in mind a way to allow SQL Server to embrace objects—beyond support for binary large objects—because its application development tool strategy hinges on object-oriented products inherited with the acquisition of Gain Technology, Inc. in 1993. Gain tools are based on Objectivity, Inc.'s database.

With the possible exception of IBM's DB2, proprietary databases are "not a factor" in major IS database purchasing decisions, said Peter Cabbage, an analyst at Dataquest, Inc. in San Jose, Calif. IBM was smart to build versions of its mainframe DB2 database for AIX and OS/2, he said. "If the mainframe is going to be cannibalized, IBM's going to do it."

Digital Equipment Corp.'s proprietary Rdb database will continue to be enhanced but "it clearly is not strategic because of its ties to VAX," Cabbage said. X systems are losing their luster. "Digital focuses on its new Alpha architecture. And Hewlett-Packard Co. is likely to devote more time to making OpenVMS object database a success at the expense of its Alpha, analysts noted.

Outsourcing-savvy users looking for partnerships

By Mark Hupner

With the information systems community having grown more outsourcing-savvy, 1994 is shaping up as the year in which customers will stirle claim that force outsourceurs to live up to marketing claims of "partnership."

IS shops are looking for ways to price outsourcing deals so that they compensate the vendor based on actual business results derived from the outsourcing relationship.

The trend toward using outsourceurs as part of a distributed systems strategy is well under way, so users are looking for new pricing paradigms that rely less on the old CPU cycle and direct-access storage device models of the mature mainframe outsourcing world.

In a model example from 1993, Perot Systems Corp. derives compensation from European International on a revenue-sharing basis. Unicaire Corp. distributed revenue from Nineteen of America, Inc. based on how many video game cartridges are sold through a Unicaire-supported electronic data interchange system.

"A lot more deals are going to be value-based with the price tied into results achieved," said Julie Schwartz, an analyst at Dataquest, Inc. Vendors and customers agreed, however, that it will be difficult to establish an equitable formula for measuring the impact of an outsourceur on a customer's business.

Large Systems

Slow growth awaits AS/400

By Craig Steedman

1984 looks to be a year of transition on two fronts for IBM's AS/400 line. IBM is expected to fully deliver on the client/server capabilities it promised for the AS/400 last September, and it will also start to prepare for the big 1995 jump to the PowerPC architecture.

A range of products tilted toward client/server computing is scheduled to arrive during 1994 to make the AS/400 more competitive with Unix systems. IBM executives acknowledged that AS/400 shipments were likely to be flat or down in 1993, after declining last year from their peak in 1991.

The OS/400 operating system, its integrated database and IBM's TCP/IP implementation for the AS/400 are all being rewritten as part of the client/server initiative. A 486-based I/O processor aimed at file server uses is also due, according to IBM.

However, many of those products are not scheduled to ship until late in the year, which analysts say will probably limit IBM's ability to generate client/server momentum. "There's not a lot of

tangible impact now," noted Kevin Beam, director of research at Reliability Ratings, Inc. in Needham, Mass.

David Andrews, managing partner at D. H. Andrews Group, Inc., a Cheshire, Conn., consulting firm, said he expects another year of flat shipments or slight growth for the AS/400. IBM also has to overcome marketing and sales coverage problems resulting from layoffs, he said.

Holding steady

Andrews said 1993 unit shipments should end up in the 45,000 range, down from about 51,000 in 1992, although revenue will probably be close to flat. The AS/400 installed base is approaching 200,000 units, and users do not appear to be moving away from the machine, he added. "It's not a business that's falling apart."

New AS/400 hardware is expected in the second quarter rather than the usual February time frame. Andrews said a performance boost of about 30% is likely. IBM has shown that "PowerPC" chips may show up in limited roles toward the end of the year, but the full migration to that architecture will come in 1995.

Prince

CONTINUED FROM PAGE 85

need to change systems.

Second, the horrible realities of integrity and security issues in large networks will become obvious, even to technology gurus. This means legacy systems are suddenly going to look pretty cool. My hunch is we will see many new applications being built on small machines but run on mainframes...er, virtual reality servers.

So parallel DBMS will be hot, and we may even see some old large-systems players gain size—after suitable rebranding, of course (how about Easytrieve Multimediate?).

Here's one sequence of possible events to ponder:

First: IBM finally gets real mean and drops prices for its mainframes below those for Unix mainframes (in terms of cost per MIPS).

Then: In response, some Unix mainframes offer emulation of MVS, add CICS and drop their prices, too.

Next: Mainstream Unix mainframes push MIP even harder to grab back the price-per-MIPS edge. Borland announces Parallel Paradox (delivery 1998).

So: The prices of large systems drop so much that people begin to use them as servers for all kinds of activities. Many of the small server vendors promptly go broke and use IBM again for antitrust.

As a result: Even more new types of transaction processing monitors are introduced (deal with these new types of data, CICS/SM is an instant hit).

Of course: This spurs the last market penetration of AS/400s, led by Or-

acle, which results in major reductions in cost per transaction. Other DBMS vendors without the parallel option respond by offering their add-on applications in suites. The DB2 suite floats, however, and ends up bundled with Lotus SmartSuite (with Quicken thrown in for free).

As you might expect: A price war, far worse than the one we've seen to date, breaks out among mainframe vendors, pushing price per MIPS to unprecedented low levels and below the MIPS costs of client/server systems.

But then: Small systems fight back by tying distributed servers into virtual mainframes, using ATM and cable for wide-area channel speed.

All types of systems add CICS-ROM and optical RAID and because of massive storage, claim they are a large system irrespective of their processors' power or the integrity and security they provide to their OLTP systems.

Would you believe? The edge in these mainframes was provided by transaction processing monitors, so the competition among these monitors heats up. Client/server tries a sneaky fight back by claiming that NT with Top End from NCR gives you all you ever had with MVS, MVS and CICS. A series of unholy alliances results, leading to the ES/9000 Windows, the NT/CICS and the SynOptics/Oracle Universal MPP server large systems.

Result: We all end up being thoroughly confused as to what the difference is between small and large systems, since client/server finally gives up and offers real security, integrity and even lower prices, and we start all over again. Stranger things have happened.

Prince is president of Perth Ventures, Inc., a strategic technology consulting firm in Hawley, Pa., and New York.



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Forecast '94: Application Development

The coming object backlash

OPINION BY ED YOURDON

I FAUNT MATILDA AND UNCLE BART GRABBED YOU at the family Christmas party and asked you what you thought was going to happen in the software industry in 1994. They were probably not interested in new releases of IBM's MVS operating system. Chances are they were more interested in the next version of Windows. Or even object orientation.

In fact, object orientation has become such a phenomenon that I believe we'll see the beginning of a backlash soon.



Recent industry surveys have shown that popularity of object orientation has tripled in the past two years, from approximately 1% of application projects to 12%. But the success rate of projects has dropped from 95% to approximately 65% during the same period.

If this trend continues, we should expect to see object orientation use hit 20% in 1994, but the success rate will drop below 50%. And then everyone will begin howling that object orientation has failed—just like the last silver bullet, CASE, disappointed us the last time around. CASE, on the other hand, might surprise us in 1994. Perhaps we'll discover that it's not dead after all.

The Department of Defense (DOD) has finally made its long-awaited decision on integrated

Yourdon, page 92

Object technology

Standards set to take hold

By Melinda-Carol Ballou

■ The year 1994 is likely to pave the way for object proliferation in 1995, if object standards jell on schedule.

The coming year will also be a turning point for the following emerging object standards and technologies:

- Interoperability for the Object Management Group's (OMG) Common Object Request Broker Architecture (CORBA).

- Specifications for the Open Distributed Processing (ODP) standard from the International Standards Organization (ISO).

- Microsoft Corp.'s Distributed Object Linking and Embedding (OLE).

- Microsoft and Digital Equipment Corp.'s Common Object Model (COM).
- Component Integration Laboratory's (CIL) OpenDoc tool kit.

The OMG's focus with CORBA has been to help objects communicate with one another through a common inter-

Price wars pressure low end

By Melinda-Carol Ballou

As developers look back on 1993, they may view with affection the low-end tools pricing wars, which provided them with cut-rate deals in the late spring and early summer.

Microsoft Corp. lowballed pricing for its popular Visual Basic tools at a discount rate of \$395 from May to July. Other vendors such as Progress Software, Inc. and JYACC, Inc., dropped runtime licensing fees in reaction to the bait from the low end.

Challenges to Visual Basic by Borland International, Inc. and Lotus Development Corp. early in 1994 may put additional pressure on low-end pricing, according to Tim Harmon, analyst at Meta Group, Inc.'s consulting offices in Burlington, Calif.

But users should be aware of the consequences of pricing wars on customer support for high-end development tools, according to Peter Kastner, vice president at the Aberdeen Group, a Boston-based consulting firm.

"Buyers should not be fooled—we don't get a lot of support with a shrink-wrapped product," Kastner said. "[High-end] suppliers have to cover their very high R&D costs [up to 25% of sales] and marketing and support, as they help hand-hold users in learning how to use the more powerful tools. If you think that you're going to get that for \$199, wish again."

face language, object services and application programming interfaces. CORBA acts as a traffic cop for objects and has been implemented by various vendors, including IBM, Digital, Hewlett-Packard Co., Sun Microsystems, Inc. and Novell, Inc. via HyperDesk, Inc. But up until now, a product could be CORBA-compliant but incapable of interoperating with other CORBA-compliant products.



Source: Meta Group, Inc., Woburn, Mass.

The OMG's CORBA 2 specification will change that. OMG officials and some industry analysts said. Thirteen companies expressed their intentions to offer proposals to the OMG last month and will have three months to negotiate with one another before meetings a March submission deadline.

Standards, page 93

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Yourdon

CONTINUED FROM PAGE 91

CASE (I-CASE) technology: A \$400 million contract has just been awarded to a consortium led by Lockheed. I believe the ramifications of this contract will give the entire CASE industry a massive jolt of adrenaline. By focusing on integration of tools, the DOD might be able to accom-

plish what IBM hoped to accomplish with AD/Cycle.

Back to object orientation for a moment. One of the things we'll see in 1994 is the emergence of object-oriented Cobol.

Will anyone care? For the most part, the PC community of C++ and hackers and Smalltalk purists will snicker. But if the results get too nasty, the Cobol community has a right to ask, "What kind of language did you say C++ was? An evolu-

tionary upgrade from an older language or a hodgepodge that encourages both the best and the worst of object orientation programming?" Sounds like object-oriented Cobol to me!

Off the sidelines

I'd rather avoid both C++ and object-oriented Cobol, but there are millions of Cobol programmers who have been watching the object orientation movement from the sidelines; with features such as

inheritance, polymorphism and encapsulation in their language, maybe they'll join the game, too.

On the software engineering front, the big news in 1994 will probably be the initial version of an ISO-9000 standard specifically aimed at software; the current non-specific version is widely touted in Europe but has been loudly criticized in the U.S. as being irrelevant, if not downright silly.

Even more interesting will be the efforts by the Software Engineering Institute to combine the best ideas of ISO and the institute's process maturity model.

New versions of the institute's model are also being developed to incorporate "peopleware" concepts. This should help focus the attention of many companies on the negatives of a current approach that Software Engineering's Bill Curtis calls the "herded" approach, which refers to organizations treating their professional software people as if they were cattle.

So much for what we can reasonably expect—but what would we like to see in 1994?

Dear Santa...

Here's the list that I left for Santa with a note saying anytime in the year would do.

First, I would like to see Microsoft fall flat on its face for a month or two in 1994, so that it could acquire some humility and avoid a disastrous IBM-style collapse a few years later.

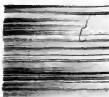
Second, I wish a software organization, somewhere, would demonstrate with some credible metrics that it can achieve order-of-magnitude productivity and quality improvements through software reuse.

And third, I wish a software organization would confirm, with some credible metrics, an observation that Tom DeMarco made at the Fall '90 Case/World conference: that there is no such thing as overtime in a software project and that "overtime" is a political game that we play to avoid feeling guilty when the project is late. Software is lots of fun, as we all know—but it might be a lot more fun if we didn't always feel compelled to work 80-hour weeks.

Whaddya say, Santa: Can you make that list wish come true?

Yagdon is author of the book *Devolve and Fall of the American Programmer* (Premier Hall). He is also a management consultant and editor of the software journal *American Programmer*. He can be reached at 712/254-2222 or compserve.com.

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Standards

CONTINUE FROM PAGE 91

The OMG is expected to release the final interoperability specification by third-quarter 1994, and products supporting it are likely to begin shipping by late 1994 and early 1995.

"I think vendors are really anxious for that standard to emerge, as are users," said Hugh Bishop, vice president at the Aberdeen Group, a consulting firm in Boston.

Working now in tandem with the OMG is an ISO committee that is setting the international standard for ODE. ODP is a reference model that offers an architecture for enabling the creation of distributed processing systems.

While the OMG has spent time establishing the specifications from the ground up for distributed object services, Microsoft has made OLE a de facto standard for Windows programmers.

Microsoft is creating a distributed version of OLE, which had previously existed only on the desktop, and began shipping a preliminary developer's kit last month. Distributed OLE is expected to ship during the third quarter of 1994.

Digital participated in the first cross-

platform demonstration for distributed OLE last November and will establish, with Microsoft, COM as a technology that will enable OLE objects to interoperate with CORBA objects. COM will include a communications protocol based on the Open Software Foundation's Distributed Computing Environment and a subset of OLE and Digital's CORBA-compliant Object Broker.

The two companies will ship an early cut on the specifications for industry

comment and review during the first quarter of 1994, with a general release targeted for the third quarter.

OpenDoc, an object-oriented technology and self-styled rival to OLE for creating and managing distributed, compound documents, will ship during 1994. OpenDoc is being developed by CIL, a group of vendors including Apple Computer, Inc., IBM and WordPerfect Corp. The developer's kit for OpenDoc will be available in the first quarter of 1994.

Briefs

Cadre to supply IBM CASE

Cadre Technologies, Inc. in Providence, R.I., was selected by IBM Federal Systems Co. to be the primary provider of computer-aided software engineering tools for the U.S. Army's Sustaining Base Information Services project, a 10-year, \$474 million effort to build a worldwide information and telecommunications system for business and administrative functions.

Wang names VP

Wang Laboratories, Inc. has named Dale Troppio vice president of applications tools and services, with responsibility for development of the company's Pace database and development tools plus other products. She worked previously at Molecular Simulations, Inc., a Burlington, Mass., software vendor.

Microsoft, Spectron deal

Microsoft Corp. has signed a deal with Spectron Microsystems under which it will license Spectron's application programming interface (API) for digital signal processors as part of a bid to create standards for multimedia Windows applications. Media Vision, Inc. also licensed the same set of APIs.

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NT won't drain the WINDOWS savvy

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If you haven't been exposed to either API, expect a six-month learning curve. After that, your big adjustment when

NON-EXPOSURE

If you're already familiar with the Windows NT application programming interface (API), you can learn the CURVE to gain proficiency. The Windows NT API is a superset of the Windows API, with slightly different parameters and about 200 additional programming interfaces to know.

This function is not necessary when programming for Windows NT; each application runs in its own address space as a separate process with its own sys-

Programmers can also draw on past experience when it comes to mastering multithreading and multitasking, two key capabilities that set Windows NT apart from its predecessor. If you have used another 32-bit operating system, such as VMS or Unix, you shouldn't have

"NT is the crossover point between PC and multitasking operating systems," Therrien says. "Other operating systems have had preemptive multitasking capabilities, but Windows NT is one of the first multitasking operating systems for the PC."

Baum is a free-lance writer in Santa Barbara, Calif.

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UNCONVENTIONAL wisdom

Quips, quotes and other pieces of careers-related information

WANTED: Project managers who can estimate realistically

Can accurately estimating a project's cost help your career? It seems so, according to a survey of information systems managers conducted by the Center for Project Management in San Ramon, Calif., and the Association for Systems Management in Cleveland. With 124 managers responding, only 36% said their project managers were either well-prepared or above average in their ability to develop viable estimates, while 64% said their project managers were average, below average or barely prepared at all.

FEAR MAY BE PART of the problem, says Joe Kollinger, a project manager at Pacific Bell's systems technology division in San Francisco. IS project managers are often reluctant to negotiate for project costs and deadlines because they are afraid to challenge project sponsors.

"If you've always run an eight-minute mile, why agree to run a three-minute mile just because someone says you have

to?" Kollinger says. "Look at your past experience, your project history and build an effective case for why you can't [meet a short deadline] and the project sponsor will come around."

AND JUST HOW MUCH can you expect to make with such skills under your belt? A project manager in a large company, defined as having an IS staff of more than 50, can earn as much as \$68,000 as a project leader and up to \$70,000 as a senior project manager, according to Robert Half International, Inc. Moreover, project management salaries seem to be on the rise, according to statistics.

Project management salaries up from '92

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Source: Robert Half International, Inc., Menlo Park, Calif.

Betting on business units

REACTING TO END USERS

Do you ever feel like you're spending all your time reacting to crises while everything else you're supposed to do lapses? You're not alone, according to a Nolan Norton & Co. multiclient study, "Managing End-User Computing." Nolan Norton discovered that "it is typical to observe end-user computing staff spending most of their time in the technical and user support areas, generally in reactive mode," and even drawing staff away from planning, research and management tasks. The bulk of staff energy is spent on troubleshooting, help desk calls, installing and testing hardware and software and monitoring system performance. This trend is expected to continue, the study said.

Teaching OLD DOG

Just what are those books that give managers such lofty ideas? "Essential," says Madeline Weiss, president of Weiss Associates in Bethesda, Md., and chairman of the Society for Information Management's international strategic planning committee.

"We need to be continuous learners," she says. "We have to be open to different perspectives." Here is one of her suggestions:

The Dancing Healers by Dr. Carl Hammerstreich (1988, Harper & Row, New York) discusses the importance of adopting and learning from new perspectives.

"You need to look beyond your own way of doing things and find new approaches. The author spent years living on Indian reservations studying how different tribes heal. Part of the process is that you have to do the dance. In IS, if we want to help, or heal the client, we have to do the dance — we have to take an active role and get in their shoes and see their perspective."

—Compiled by Leslie Off

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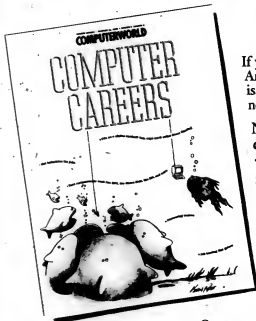
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"Because Executive Infosource is a niche product provider, we have a unique story to tell. All of our System 370/390 rack-mounted processors are excellently refurbished, completely equipped, and fully eligible for IBM maintenance. Equally important, however, is the technical expertise we provide to a large number of end users. From planning and expertly configuring systems per customer specifications to offering complete system engineering support, Executive Infosource does it all - and with the highest level of customer satisfaction. To increase our awareness among new sales prospects, we advertise in *Computerworld's Marketplace Pages*.

"Since *Computerworld* is widely read by decision-makers, *Computerworld's Marketplace Pages* give us wide reach to prominent buyers. Based on our results, it's the best publication for telling IS management about our 370/390 solutions for economical mainframe processing when application requirements are complex. It's also the best place for fastening partnerships with software developers so that we can offer clients better pricing and value-added system engineering support via a team approach.

"On average, our responses come from a broad spectrum of highly qualified prospects, and our end-user draw is significant. In fact, new business generated by our weekly advertisements in *Computerworld's Marketplace Pages* more than pays for our advertising costs. Another significant outcome is our changing market ratio. Once 90% foreign and 10% domestic, our business now runs about 50%/50%, so it's fair to say that our weekly advertising in *Computerworld's Marketplace Pages* has substantially increased our viability in the U.S. marketplace. Amazingly enough, we've even finalized export deals with readers of *Computerworld's U.S. edition*.

"While there's a certain prestige associated with appearing in *Computerworld* week after week, proven results are our first and foremost reason for advertising in *Computerworld's Marketplace Pages*. Every week."

Computerworld's Marketplace Pages. It's where computer buyers meet computer sellers - every week. Just ask David Russo of Executive Infosource. To put your classified sales message into the hands of 629,000 influential buyers, call John Corrigan, Vice President/Classified Advertising, at 800/343-6474 (in MA, 508/879-0700).

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"...In sales revenues, our Computerworld Direct Response Card advertisements return as much as 15 times the cost of the card itself."

-Marry Murphy
President
Faulkner Information Services

Calling itself "The Definitive Resource for the World of Computers and Communications," Faulkner Information Services is an information service provider headquartered in Pennsauken, NJ. Targeting a broad customer base worldwide, President Marry Murphy has made *Computerworld Direct Response Cards* an integral part of the company's strategy for deriving new business.

We deliver information to IS and communications professionals and end-users in a number of ways. Our management report series comprises over one dozen print offerings addressing key technology areas such as open systems, document imaging and networking. Complementing our information in print, users can gain faster and easier access to our information via three powerful CD-ROM products - MicroData Infodisk, Communications Infodisk, and DataWorld Infodisk. Being one of the very first providers of this type of information in CD-ROM format, we also offer attractive network licensing which allows Faulkner customers to lower their per-user cost.

"With such wide-ranging product applications, our target audience encompasses three customer categories: large end-user companies with heavy investments in both hardware and software; manufacturers and developers of computers and communications equipment and software; and large systems integrators and technical libraries serving as consultants to end users. And *Computerworld Direct Response Cards* let us penetrate all three of our customer classes - with just one advertising resource. Plus, we get the flexibility to test different offers with our entire product mix.

"In our multi-level advertising approach, card decks traditionally rank among our best-lead sources. In fact, we average up-

wards to 750 responses for each *Computerworld Direct Response Card* we run. Clearly, they provide our telemarketing staff with a steady stream of high-quality, trackable leads. And, in sales revenues, our *Computerworld Direct Response Card* advertisements return as much as 15 times the cost of the card itself. With Faulkner Information Services being a small company, *Computerworld Direct Response Cards* are our most cost-effective vehicle for reaching a large base of ideal prospects in the world of computing.

"To maintain our aggressive double-digit growth in sales, we must maximize our advertising dollars to build our image in the marketplace, increase awareness of existing products, introduce new products, find new prospects, and increase sales. As long as they keep working, *Computerworld Direct Response Cards* will continue to be an important aspect of our marketing strategy."

Computerworld Direct Response Cards give you a cost-effective way to reach *Computerworld's* powerful buying audience of over 137,000 computer professionals. Every month. They're working for Faulkner Information Services - and they can work for you. Call Norma Tamburino, National Account Manager, *Computerworld Direct Response Cards*, at (201) 587-0090 to reserve your space today.

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Advertisers' Index

Andahl	74-75
Ardis	69
B I Moyle Associates, Inc.	89
BMC	90
Command Technology	91
Compaq Computer Corp.	66-67
CW Ancillary	78
CW Circulation	76-77
CW Classified	
16, 69, 74, 75, 92, 93	
CW Marketing	94-95
Deli	40
Digital Equipment Corp.	14, 22-23
Hewlett-Packard	12, 92
IBM	
36-39, 50-51, 60-61, 84, 93	
IDUG	29
Information Builders	11
Ingres	86-87
Knowledgeware	25
Micro Focus	18-19
Microsoft	64
NBC Technologies	70-72
Oracle Corp.	5, 9
Platinum Technology	26-27
Progress Software	46-47
Ross Systems	10
SIM Technology Summit	61-63
Software Engineering of America	C4
Sterling Software	7
SunSelect	21
Synsort	3
Windows World Open	C3
Wyse	54-55

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Companies in this issue

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Wysiwyg

Engineers at software company Cygnus Support, in a moment of sheer techno-inspired yuletide spirit, programmed the company's internal network to enable users to issue commands to the decorations on the company's tree, located in the lobby at the company's Mountain View, Calif., headquarters. Users can bring up a window application called "xmasree" and light the lights and turn other decorations, such as bubble lights and musical bells, on or off. Anyone at any Internet site can check on the current status of the tree's decorations through the command "finger xmasree@cygnus.com."



Need a gift for the cook who has everything? Pinpoint Publishing has come out with *Micro Cookbook*, a PC-based recipe and nutrition software package. With it you can create a family cookbook by adding your own recipes or choosing from more than 1,000 included. The software calculates a nutrition summary for all recipes and menus, including ones you add yourself.

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Illustrations & Design By David Marshall



PAUL PREDICTS

A wacky look at the events ahead in 1994 by Editor Paul Gillin.

- ▶ After two months of meticulous tuning and reprogramming, the Hubble Space Telescope will be turned on to reveal the finest images ever seen of an astronaut's missing screwdriver.
- ▶ A highly visible, quotable and technically respected CIO will shock the industry by not quitting to become a consultant.
- ▶ Microsoft will announce a six-month delay in Windows 4.0 because of problems implementing Super Tetris in the games group.
- ▶ The IBM PC Co. will proudly announce that its new products are so successful that it will be unable to fill any more orders for several years.
- ▶ Seeking a competitive edge in the outsource software price wars, Borland will announce that it will pay people to buy Quattro Pro for Windows.
- ▶ Lotus will announce plans to buy 600,000 copies of Quattro Pro for Windows.
- ▶ Apple will announce an upgrade to the Newton MessagePad. The device will finally be able to recognize printed characters as long as the writer uses the letters A through E.
- ▶ Plans to construct an information superhighway will be delayed when it's discovered that the national multimode optical communications network is being funneled through a 1,200

bit/sec. modem in Kansas City.

- ▶ Lotus will introduce Crib Notes, a version of its groupware product that allows college students to prepare hypertext documents that make it look like they really read the book.
- ▶ A group of industry consortia will merge into a single entity known as the COSEPCMCIA-OSFIBANSI. The move will spark a mass res-



ignation by Computerworld headline writers.

- ▶ IBM's mainframe division will launch an ad campaign stating that not only are mainframes outstanding transaction processing machines, but they also make handy contraptions.
- ▶ A major downsizing effort in the travel industry will be scrapped when the system goes live and immediately rebooks 17,000 confirmed reservations into a single hotel room in Parsippany, N.J.
- ▶ The U.S. will outsource Rose Perot to EDS.



Inside Lines

It's always something

Elements of Microsoft Office 4.0 continue to slip. PowerPoint 4.0, which was scheduled to ship in December, is now slated to ship in January. A Microsoft spokesman attributed the delay to repeated testing. "They hit the target date within two weeks, they're happy," he said.

Users get first whiff of messaging server

Initial test releases or "limited beta" versions of Microsoft's Enterprise Messaging Server (EMS) have shipped to roughly 15 major user sites, a Microsoft spokesman confirmed. Symantec said the initial reaction is that it looks like EMS is delivering the X.400 messaging server and management functions that Microsoft has promised will be in the product when it ships in mid-1994. The product is still officially unannounced.

Management games

Unix system management platform rivals OpenVision and Tivoli Systems are shuffling it out in earnest on at least two fronts. Both are trying to snag third-party applications that were developed for Distributed Manager, the former Unix System Laboratories Unix management suite that Novell recently scrapped (CW, Dec. 20). Tivoli can perhaps offer easier migration because Distributed Manager was based on its own Management Framework. OpenVision is also trying to get X/Open to request a request for technology for a common set of system management APIs. OpenVision wants to submit its own set of APIs to compete against Tivoli, which will now have the only vendor to respond to X/Open's request for technology.

Redmond, hol

Digital experts Microsoft's Windows NT to be the company's lead operating system for new business and OpenVMS migration within two years, despite its short-term emphasis on DEC OSF/1. "If a user was planning on making the move [from OpenVMS] two years from now, I'd probably tell him to go to NT," Digital's Chief Technical Officer William Strecker said in a recent interview. "If he was making it next year, I'd probably say OSF/1."

Questions, answers, questions

Symantec Corp. has discontinued development efforts of both the DOS and Windows versions of Q&A, according to the recent buzz on our Prodigy bulletin board. Symantec officials reportedly sent out letters to customers saying both versions of the integrated application were not significant revenue generators and that the company would not produce follow-ups to the existing products.

A chip off the new block

Silicon Graphics plans to top up its low-end 34,800 Indy workstation with a high-powered, 180-MHz 24400 MIPS chip that reportedly boosts performance of computer-aided design and multimedia programs by 50%, company sources said. Three new Indy models with range in price from \$5,995 to \$82,995, covering much of the Unix workstation industry's power range. The Indy machines are set to ship in March, but users who wait said last year will be able to buy upgrade kits that clip on to the original Indy's backplane.

The marketing inside at Hewlett-Packard has decided that "you-BOC" is not such a clever term for the company's next-generation processor (CW, Dec. 4). "When you say 'you-BOC' anything, you raise concerns about compatibility," an HP spokesman noted. So while the company's research lab will continue to use the nomenclature internally to designate the chip, HP is publicly referring to the future component as the 74-4000 and leaving consumers that the chip will be binary compatible with other HP models. Users are advised to see further proof. Phone, fax or Computerworld News Editor Alvin Apter with news tips at (800) 349-6414, (508) 375-0013 or 783-7413, respectively. Or by Computerworld's 24-hour voice-mail tip line at (800) 350-5565.

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